



**NAVAL
POSTGRADUATE
SCHOOL**

MONTEREY, CALIFORNIA

Physical, Nutrient, and Biological Measurements of
Coastal Waters off Central California in November 2007

by

Thomas A. Rago, Reiko Michisaki, Baldo Marinovic, Marguerite Blum, and
Katherine Whitaker

July 2008

Approved for public release; distribution is unlimited.

Prepared for: Marine Sciences Institute,
University of California, Santa Cruz

THIS PAGE INTENTIONALLY LEFT BLANK

NAVAL POSTGRADUATE SCHOOL

Monterey, California 93943

Daniel T. Oliver
President

Leonard A. Ferrari
**Executive Vice President
and Provost**

This report was prepared for and funded by: Marine Sciences Institute, University of
California, Santa Cruz.

Reproduction of all or part of this report is authorized.

This report was prepared by:

THOMAS A. RAGO
Oceanographer

REIKO MICHISAKI
Oceanographer

BALDO MARINOVIC
Research Biologist

MARGUERITE BLUM
Oceanographer

KATHERINE WHITAKER
Marine Mammal Observer

Reviewed by:

Released by:

CURTIS A. COLLINS
**Professor/Principal Investigator
Dept. of Oceanography**

MARY L. BATTEEN
**Professor and Chairman
Dept. of Oceanography**

DAN C. BOGER
**Interim Vice President
and Dean of Research**

THIS PAGE INTENTIONALLY LEFT BLANK

| | | | | |
|---|---|--|--|--|
| REPORT DOCUMENTATION PAGE | | | Form Approved OMB No. 0704-0188 | |
| Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503. | | | | |
| 1. AGENCY USE ONLY (Leave blank) | | 2. REPORT DATE July 2008 | 3. REPORT TYPE AND DATES COVERED Technical Report, November 2007 | |
| 4. TITLE AND SUBTITLE: Title (Mix case letters) Physical, Nutrient, and Biological Measurements of Coastal Waters off Central California in November 2007. | | | 5. FUNDING NUMBERS | |
| 6. AUTHOR(S) Thomas A. Rago, Reiko Michisaki, Baldo Marinovic, Marguerite Blum, and Katherine Whitaker | | | | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000 | | | 8. PERFORMING ORGANIZATION REPORT NUMBER NPS-OC-08-004 | |
| 9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Marine Sciences Institute, University of California, Santa Cruz | | | 10. SPONSORING / MONITORING AGENCY REPORT NUMBER | |
| 11. SUPPLEMENTARY NOTES The views expressed in this technical report are those of the authors and do not reflect the official policy or position of the Department of Defense or the U.S. Government. | | | | |
| 12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited. | | | 12b. DISTRIBUTION CODE | |
| 13. ABSTRACT (maximum 200 words) The results of analyses of hydrographic, nutrient, and biological data collected in coastal ocean waters off Central California in November 2007 aboard the <i>NOAA Ship David Starr Jordan</i> are presented in both tabular and graphical form. The cruise departed from and returned to San Francisco, California. After steaming to Monterey Bay, the ship proceeding from Moss Landing, California, along CalCOFI line 67 to station 90, thence to CalCOFI line 60/station 90, and finally along CalCOFI line 60 to Drake's Bay, before returning to San Francisco. Marine mammal observations taken during the cruise are also included. | | | | |
| 14. SUBJECT TERMS hydrography, physical oceanography, biological oceanography, nutrients, zooplankton, marine mammals, PaCOOS, CalCOFI | | | 15. NUMBER OF PAGES 79 | |
| | | | 16. PRICE CODE | |
| 17. SECURITY CLASSIFICATION OF REPORT Unclassified | 18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified | 19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified | 20. LIMITATION OF ABSTRACT UU | |

THIS PAGE INTENTIONALLY LEFT BLANK

Contents

| | |
|---|-----|
| List of Tables | ii |
| List of Figures | iii |
| Introduction | 1 |
| Standard Procedures | 1 |
| CTD/Rosette Data | 1 |
| Zooplankton Net Tows | 5 |
| Marine Mammal Observations | 8 |
| Ancillary Observations | 8 |
| <i>Underway Data</i> | 8 |
| <i>Satellite Imagery</i> | 9 |
| <i>ADCP</i> | 9 |
| Tabulated Data (<i>in Appendix A</i>) | 10 |
| Figures of Results (<i>in Appendix B</i>) | 11 |
| Cruise Participants | 12 |
| Literature Cited | 13 |
| Appendix A | 15 |
| Table A1 | 15 |
| Table A2 | 16 |
| Table A3 | 32 |
| Table A4 | 64 |
| Table A5 | 65 |
| Appendix B | 66 |
| Figure 10 | 66 |
| Figure 11 | 67 |
| Figure 12 | 68 |
| Initial Distribution List | 69 |

List of Tables

| | | |
|-----------|--|----|
| Table 1: | Transmissivity offsets applied to each CTD cast during the PaCOOS cruise of November 2007. | 4 |
| Table 2: | Zooplankton data. | 6 |
| Table A1: | Meteorological and sea surface data collected during the PaCOOS cruise of November 2007. | 15 |
| Table A2: | List at standard pressures of hydrographic data collected during the PaCOOS cruise of November 2007. | 16 |
| Table A3: | Results of nutrient and primary productivity analyses of water samples collected at each hydrographic station during the PaCOOS cruise of November 2007. | 32 |
| Table A4: | Marine mammal observations. | 64 |
| Table A5: | Summary of marine mammal observations. | 65 |

List of Figures

| | | |
|------------|---|----|
| Figure 1: | Full CalCOFI hydrographic station grid. | 2 |
| Figure 2: | Hydrographic stations occupied during the PaCOOS cruise of November 2007. | 2 |
| Figure 3: | Transmissivity maxima by CTD cast measured by the SeaTech 25-cm transmissometer. | 3 |
| Figure 4: | Corrected (red) and uncorrected (blue) transmissivities. | 4 |
| Figure 5: | Biovolume displacement values for stations sampled along CalCOFI lines 67 and 60 during the PaCOOS cruise of November 2007. | 6 |
| Figure 6: | Krill abundance for the three most common species collected at stations sampled along CalCOFI lines 67 and 60 during the PaCOOS cruise of November 2007. | 7 |
| Figure 7: | Marine mammal sightings during the PaCOOS cruise of November 2007. | 8 |
| Figure 8: | Advanced Very High Resolution Radiometer (AVHRR) satellite image of sea surface temperature ($^{\circ}\text{C}$) of the area of operation during the PaCOOS cruise of November 2007. | 9 |
| Figure 9: | ADCP results from the PaCOOS cruise of November 2007. | 10 |
| Figure 10: | Contours of (a) temperature ($^{\circ}\text{C}$), (b) salinity, (c) density anomaly (kg m^{-3}), and (d) oxygen ($\mu\text{mol kg}^{-1}$) fields along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. | 66 |
| Figure 11: | Contours of fluorescence (volts) [upper panel] and transmissivity (percentage) [lower panel] in the upper 100 dbars of the water column along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. | 67 |
| Figure 12: | Contours of (a) nitrate (μM), (b) nitrite (μM), (c) phosphate (μM), and (d) silicate (μM) fields along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. | 68 |

Introduction

Following in a long tradition of hydrographic studies of the California Current system-- see, for example, Steger *et al.* (2000) and Collins *et al.* (2003)-- the data in this report were collected during the 6-10 November 2007 cruise of the Pacific Coast Ocean Observing System (PaCOOS) program aboard the *NOAA Ship David Starr Jordan*. The PaCOOS program was organized in 2003/2004 as the NOAA west coast contribution to the national Integrated Ocean Observing System (IOOS), and is charged with “providing the ocean information needed for the sustained use of fishery resources and protection of marine species and their ecosystem under a changing climate.”¹ PaCOOS cruises generally subsample the standard California Cooperative Oceanic Fisheries Investigations (CalCOFI) grid of hydrographic stations (Figure 1). With a slight exception, this cruise did exactly that, sampling along CalCOFI line 67 from Moss Landing, California, to station 90 (CTD casts 1-19), northwest to CalCOFI line 60/station 90 (CTD cast 23), then shoreward to Drake’s Bay, California, along CalCOFI line 60 (Figure 2). The exception was that, to increase the resolution of the hydrographic data and to maintain the convention of similar recent PaCOOS cruises (Rago *et al.*, 2006, 2007a, 2007b, 2007c), eight CTD casts were inserted between the standard CalCOFI sites along line 67. Primary productivity and zooplankton analyses were not performed at these added sites. Participants on the cruise came from the Naval Postgraduate School (Physical Oceanography and Marine Mammal Observations), the Monterey Bay Aquarium Research Institute (Nutrient Analysis and Primary Productivity), the University of California at Santa Cruz (Zooplankton Analysis), the University of California at San Diego (Physical Oceanography), and the Marine Advanced Technology Education (MATE) Internship Program².

Standard Procedures

CTD/Rosette Data:

At each site a Seabird Electronics, Inc., Conductivity-Temperature-Depth (CTD) instrument fitted with a 12-place rosette was deployed. The rosette was equipped with 12 10-liter PVC Niskin bottles for collection of water samples. The CTD was generally lowered to 1000 meters or the bottom (whichever came first), except that casts were extended to the full length of cable available for the CTD at stations 18 (2021 dbar) and 23 (2022 dbar). Where primary productivity sampling was performed, water samples were taken at depths designed to maximize resolution of the variables sampled throughout the thermocline. Where only nutrient sampling was performed³, water samples were more or less evenly spaced throughout the water column. A water sample was always obtained at or near the bottom of each CTD cast for later conductivity/salinity calibration of the CTD conductivity sensors.

Besides temperature (dual sensors), conductivity (dual sensors), and pressure, the CTD also measured fluorescence, transmissivity, dissolved oxygen content, and photosynthetically available radiation (PAR) in the water column. Except for PAR and the secondary of the dual sensors, all these parameters are reported here.

¹ <http://www.pacoos.org>

² <http://www.marinetech.org>

³ CTD stations 3, 5, 7, 9, 11, 13, 15, 17, and 18.

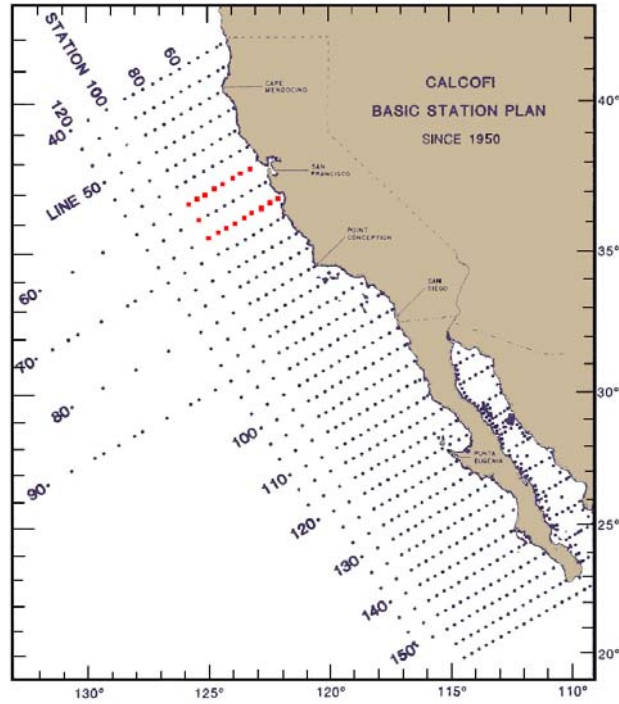


Figure 1: *Full CalCOFI hydrographic station grid. Stations occupied during the PaCOOS cruise of November 2007 are highlighted in red.*

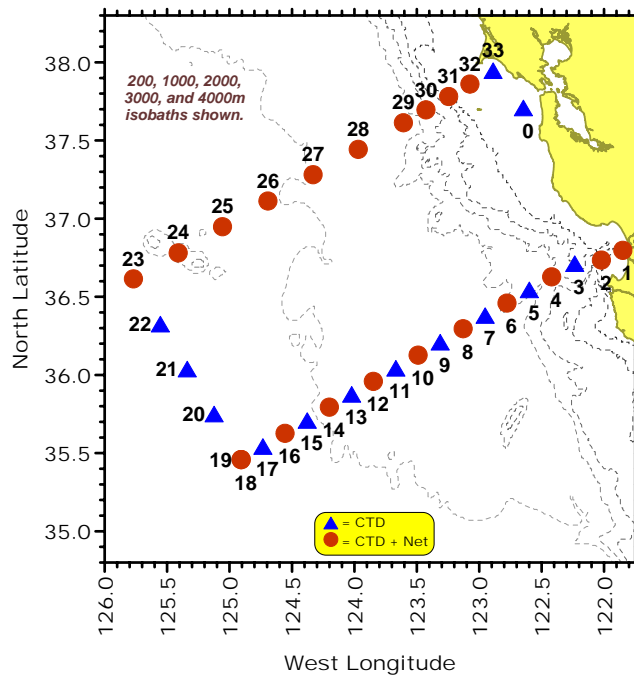


Figure 2: *Hydrographic stations occupied during the PaCOOS cruise of November 2007. 200, 1000, 2000, 3000, and 4000 m isobaths are shown. Net tows were completed at the CTD sites marked by red circles.*

Generally, a minimum of two salinity samples (including the bottom-of-cast sample) were collected from each CTD cast. These samples were analyzed after the cruise at the Naval Postgraduate School (NPS) using a Guildline model 8400B Autosol salinometer. A regression between the salinometer results and the conductivities measured by the CTD at the times the Niskin bottles were tripped was made, from which a correction to the CTD salinities was determined and then applied. The salinometer was standardized using IAPSO Standard Seawater (batch P147) before and after each set of water samples was analyzed. Salinity values were calculated using the algorithms for the Practical Salinity Scale, 1978 (UNESCO, 1981).

Dissolved oxygen (Winkler) samples were collected at CTD stations 3, 5, 7, 13, 15, 18, 23, and 28. These were analyzed after the cruise at the Monterey Bay Aquarium Research Institute (MBARI). The CTD for this cruise was outfitted with a Sea-Bird Electronics, Inc., SBE 43 oxygen sensor. This sensor is a polarographic membrane that outputs a voltage proportional to the temperature-compensated current flow occurring when oxygen is reacted inside the membrane. Dissolved oxygen concentration is then calculated from a modified version of the algorithm by Owens and Millard (1985). The results of the analysis of the Winkler oxygen samples were compared to the corresponding oxygen values recorded by the CTD. Using the method described in SBE Application Note #64-2⁴, we calculated new SBE 43 sensor coefficients. Corrected CTD oxygen values were then recalculated with the modified version of the Owens and Millard (1985) algorithm using the new sensor coefficients.

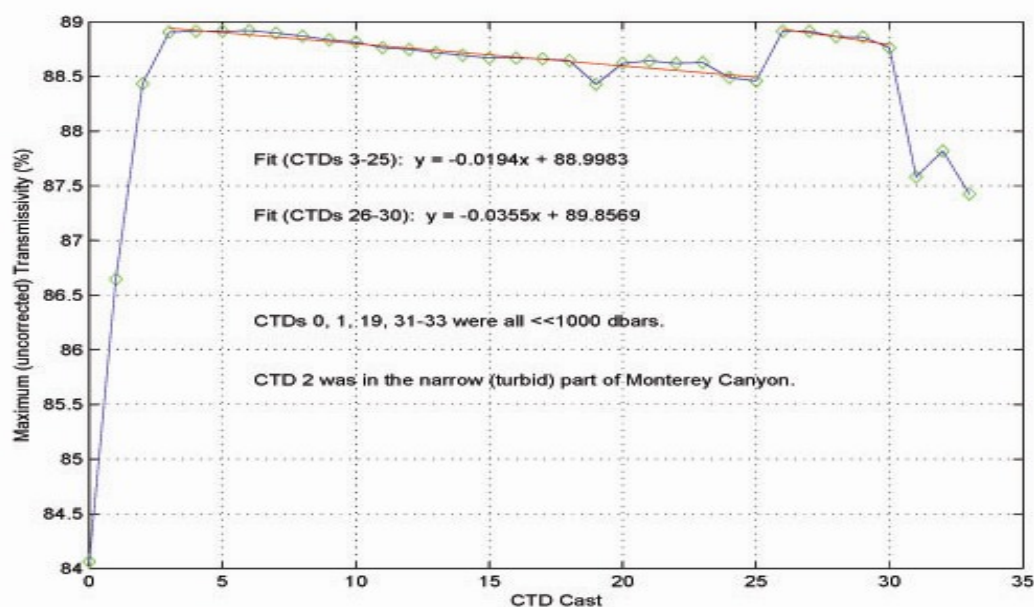


Figure 3: *Transmissivity maxima by CTD cast measured by the SeaTech 25-cm transmissometer.* Least squares linear fits were applied to casts 3-25 and 26-30. The marked shift between casts 25 and 26 was most likely because of cleaning of the instrument's windows.

For this cruise, the CTD was fitted with a Seatech 25-cm. transmissometer, whose measurements clearly drifted over time. Unfortunately, good deck values from which to correct for this drift were not obtained. Accordingly, an alternate method was devised to adjust the transmissivities

⁴See **Application notes** under the **Support** tab at <http://www.seabird.com>.

appropriately. For CTD casts to at least 1000 dbars (except CTD 2⁵), it was assumed that the CTD always reached effectively “clear” water. According to its operating manual, the transmissometer should measure “clear” water as 91.3% transmissivity. The maximum measured transmissivity for each cast was plotted versus cast number (representing the chronological order of the casts), and

Table 1: *Transmissivity offsets applied to each CTD cast during the PaCOOS cruise of November 2007.*

| CTD Cast | Offset (%) Applied | CTD Cast | Offset (%) Applied | CTD Cast | Offset (%) Applied |
|----------|--------------------|----------|--------------------|----------|--------------------|
| 0 | +2.3 | 12 | +2.5 | 23 | +2.7 |
| 1 | +2.3 | 13 | +2.6 | 24 | +2.8 |
| 2 | +2.3 | 14 | +2.6 | 25 | +2.8 |
| 3 | +2.4 | 15 | +2.6 | 26 | +2.4 |
| 4 | +2.4 | 16 | +2.6 | 27 | +2.4 |
| 5 | +2.4 | 17 | +2.6 | 28 | +2.4 |
| 6 | +2.4 | 18 | +2.7 | 29 | +2.5 |
| 7 | +2.4 | 19 | +2.7 | 30 | +2.5 |
| 8 | +2.5 | 20 | +2.7 | 31 | +2.5 |
| 9 | +2.5 | 21 | +2.7 | 32 | +2.6 |
| 10 | +2.5 | 22 | +2.7 | 33 | +2.6 |
| 11 | +2.5 | | | | |

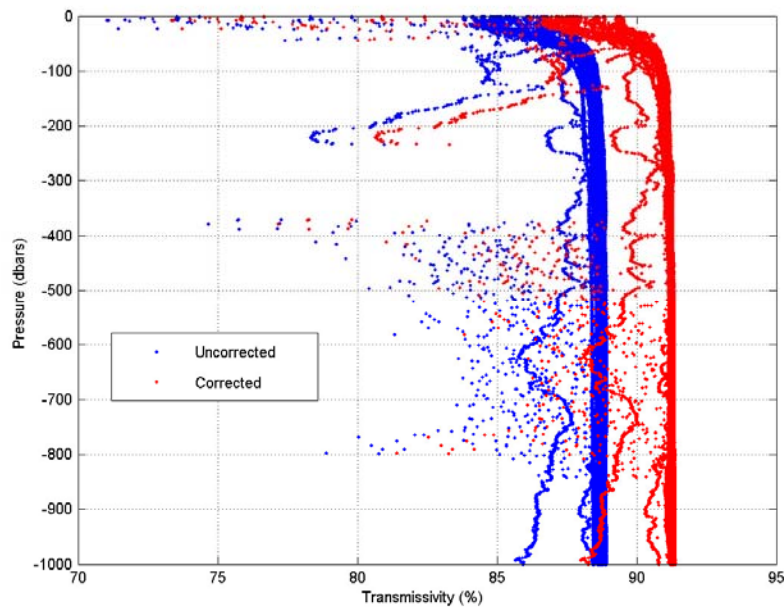


Figure 4: *Corrected (red) and uncorrected (blue) transmissivities.* This shows all the transmissivity measurements made for all CTD casts during the PaCOOS cruise of November 2007.

⁵ This cast was taken in the axis of the Monterey Canyon, where turbidity due to sediments and biology could have been significant.

least-squares linear fits were made for the appropriate (≥ 1000 dbars) casts (Figure 3). From those fits, nominal measured transmissivity maxima were calculated for each cast, from which offsets from the nominal transmissivity of “clear” water (91.3%) were calculated for each cast (Table 1). Finally, the offsets were applied to the CTD casts, giving the results shown in Figure 4.

Nutrient samples were collected in 45-ml polypropylene screw-capped containers which were rinsed three times prior to filling. Samples were frozen and returned to MBARI for later analysis on an AlpChem autoanalyzer, as in Sakamoto *et al.* (1990).

Chlorophyll-*a* and phaeopigments were collected in 280-ml polyethylene bottles and filtered onto 25-mm Whatmann GF/F filters. Chlorophyll-*a* was assayed with the standard fluorometric procedure of Holm-Hansen *et al.* (1965), modified such that phaeopigments are extracted in acetone in a freezer over at least 24 hours (Venrick and Hayward, 1984; Chavez *et al.*, 1991). Analysis was performed as possible during the cruise or at MBARI immediately following the cruise.

Primary productivity was estimated for the 100, 50, 15, 5, 1, and 0.1% light penetration depths as determined by secchi, and followed the general method of Parsons *et al.* (1984). Water samples from the appropriate depths were collected in 280-ml polycarbonate bottles, spiked with ^{14}C , and incubated on deck for 24 hours under running seawater in plexiglass tubes wrapped with nickel-cadmium screens of differing pore size. (See Pennington and Chavez, 2000, for methodology details.)

Zooplankton Net Tows:

Twenty stations⁶ (Figure 2 and Table2) were sampled for zooplankton during the cruise. All sampling was conducted with 0.7-m diameter paired bongo nets fitted with 505-mm mesh, which were towed obliquely to a depth of 210 m (or within 10 m of the bottom, whichever came first). Samples were preserved at sea according to standard protocols (Kramer *et al.*, 1972). Upon return to the University of California at Santa Cruz (UCSC), all samples were initially measured for total biovolume and subsequently processed for krill species composition and abundance.

Zooplankton distribution and abundance showed a generally similar pattern for CalCOFI lines 60 and 67. As inferred from volume displacement, zooplankton abundance was roughly equally distributed between inshore and offshore regions (Figure 5). Krill distribution, on the other hand, differed between the two CalCOFI lines. Ten species of krill were collected during the cruise, although only three (*Euphausia pacifica*, *Thysanoessa spinifera*, and *Nematoscelis difficilis*) dominated the total population (96%). *E. pacifica* was the most abundant species on both CalCOFI lines. However, it was more abundant inshore along line 67, offshore along line 60. By contrast, *N. difficilis* displayed similar patterns of distribution and abundance for both CalCOFI lines, with higher abundances at the offshore stations. *T. spinifera* was largely restricted to a single nearshore station along line 60 (60-55), where it dominated the krill species (Figure 6).

⁶ CTD stations 1, 2, 4, 6, 8, 10, 12, 14, 16, 19, and 23-32.

Table 2: *Zooplankton data.* This table lists the total biovolume abundance, as well as the mean abundance of the three dominant euphausiid species (*Euphasia pacifica*, *Thysanoessa spinifera*, and *Nematoscelis difficilis*), measured at the twenty hydrographic stations—10 each on CalCOFI lines 67 and 60—where bongo net tows were completed during the PaCOOS cruise of November 2007. The data are listed by CalCOFI line, onshore to offshore and south to north, with the line 60 data having background gray shading.

| Station (CalCOFI) Number | Zooplankton Biovolume (ml/1000m ³) | <i>E. pacifica</i> Abundance (no./1000m ³) | <i>T. spinifera</i> Abundance (no./1000m ³) | <i>N. difficilis</i> Abundance (no./1000m ³) |
|--------------------------------|--|--|---|--|
| 1 (67-C1) | 301.29 | 566.88 | 0.00 | 4.46 |
| 2 (67-M1/H3) | 271.88 | 2345.26 | 0.00 | 18.91 |
| 4 (67-55) | 121.81 | 10.83 | 0.00 | 32.48 |
| 6 (67-60) | 128.44 | 918.77 | 0.00 | 197.25 |
| 8 (67-65) | 161.07 | 177.77 | 0.00 | 129.52 |
| 10 (67-70) | 322.57 | 696.30 | 54.83 | 137.07 |
| 12 (67-75) | 101.64 | 0.00 | 0.00 | 2.58 |
| 14 (67-80) | 177.08 | 23.38 | 0.00 | 10.39 |
| 16 (67-85) | 323.93 | 1664.51 | 0.00 | 300.82 |
| 18/19 (67-90) | 174.93 | 529.43 | 4.49 | 399.32 |
| 32 (60-52.5) | 226.34 | 0.00 | 0.00 | 0.00 |
| 31 (60-55) | 382.38 | 209.62 | 2763.19 | 285.85 |
| 30 (60-57.5) | 274.44 | 870.79 | 0.00 | 104.91 |
| 29 (60-60) | 98.86 | 2.47 | 2.47 | 0.00 |
| 28 (60-65) | 150.38 | 143.07 | 0.00 | 7.53 |
| 27 (60-70) | 135.10 | 132.30 | 0.00 | 32.45 |
| 26 (60-75) | 275.78 | 3108.83 | 0.00 | 220.63 |
| 25 (60-80) | 248.94 | 431.26 | 20.06 | 351.02 |
| 24 (60-85) | 240.73 | 512.54 | 9.67 | 280.45 |
| 23 (60-90) | 287.40 | 263.06 | 0.00 | 35.08 |

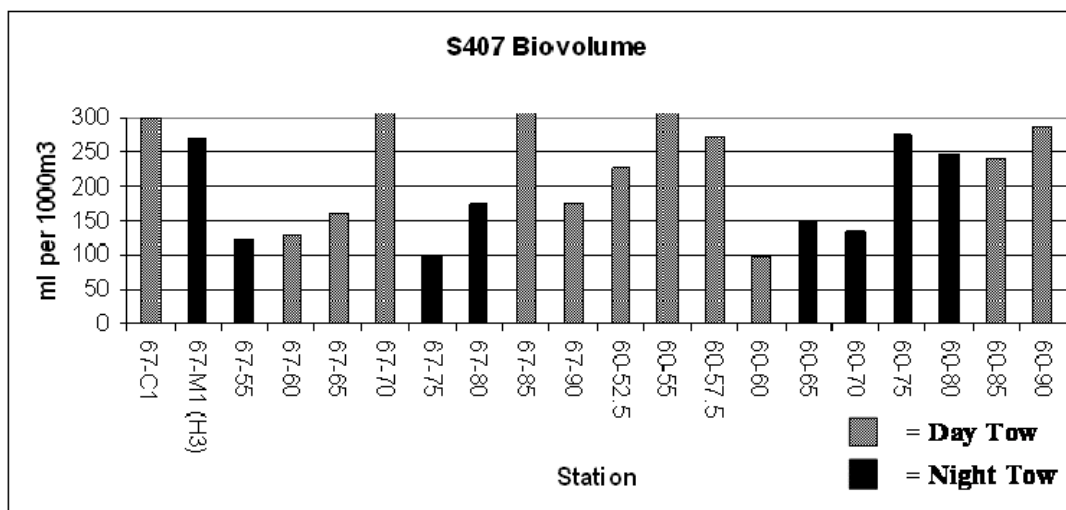


Figure 5: *Biovolume displacement values for stations sampled along CalCOFI lines 67 and 60 during the PaCOOS cruise of November 2007. Samples are arranged onshore to offshore, with stations 67-90 and 60-90 being farthest offshore for each line.*

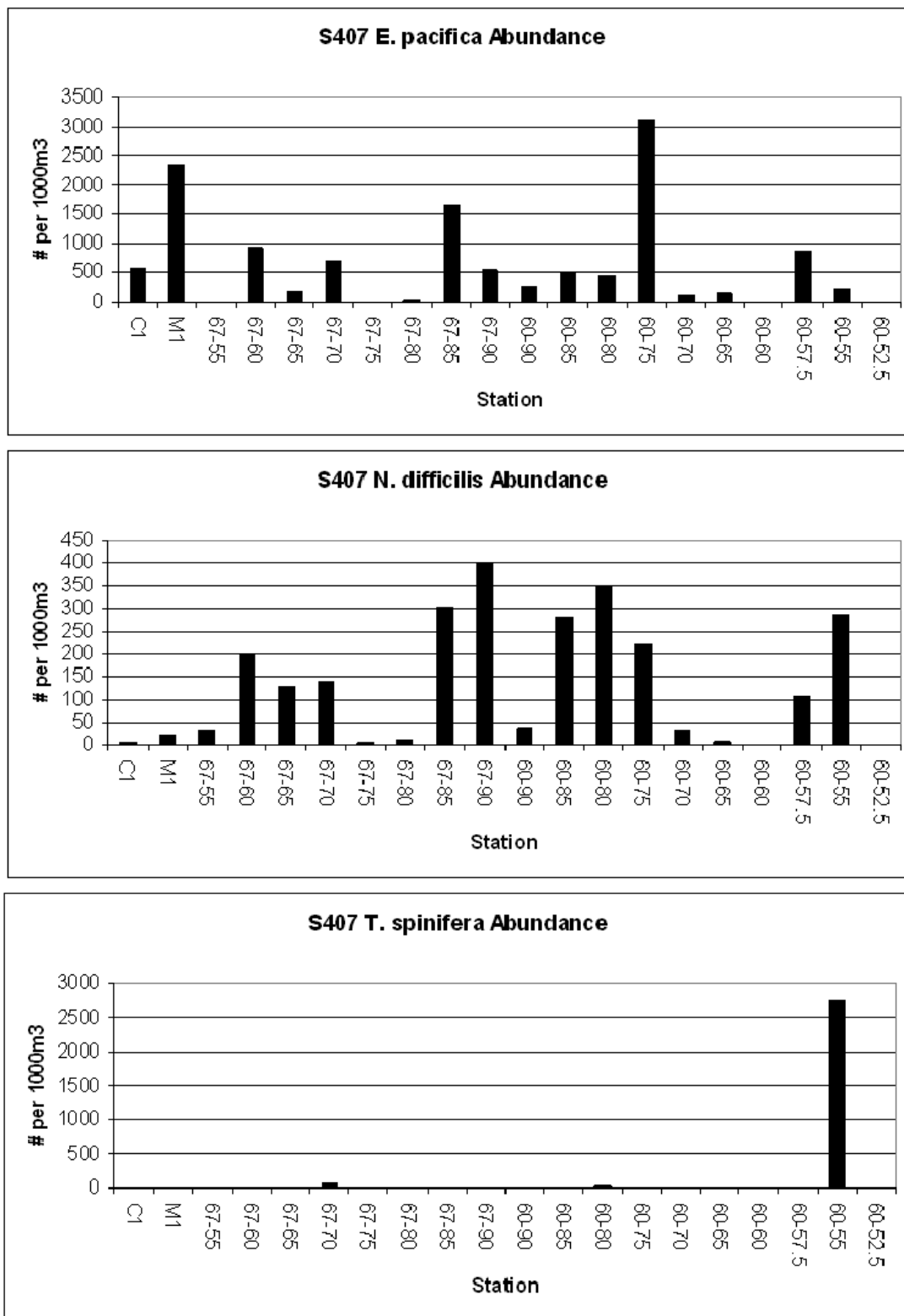


Figure 6: Krill abundance for the three most common species collected at stations sampled along CalCOFI lines 67 and 60 during the PaCOOS cruise of November 2007.

Top = *Euphausia pacifica*, middle = *Nematoscelis difficilis*, and bottom = *Thysanoessa spinifera*. Note that the y-axis scale differs for each graph.

Marine Mammal Observations:

Observations of marine mammals (Figure 7, Tables A4 and A5) were made by a single observer during daylight hours (approximately 1400 to 0100 Coordinated Universal Time [UT]) throughout the cruise, conditions permitting (e.g., clear or high clouds, Beaufort state less than 4, etc.). Observations were made from the 03-deck (above the Bridge), where eye height was approximately 20 meters above the sea surface, using handheld Fujinon 7 x 50 binoculars with compass for bearing and reticle for distance. Observations were recorded on a laptop computer using the marine mammal and bird mapping program *Seebird* (developed at the Southwest Fisheries Science Center). This program interfaces with handheld global positioning system (GPS) devices, and allows the generation of observation logs containing the observations of the mammals themselves with matching ship's velocities and positions, observational conditions, etc. Generally, intensive "on effort" observations were made during the last half of each half-hour period, with the other half of the half-hour period devoted to less intensive "off effort" observations. Depending on the situation, the observer would take short breaks from the observations approximately every two hours.

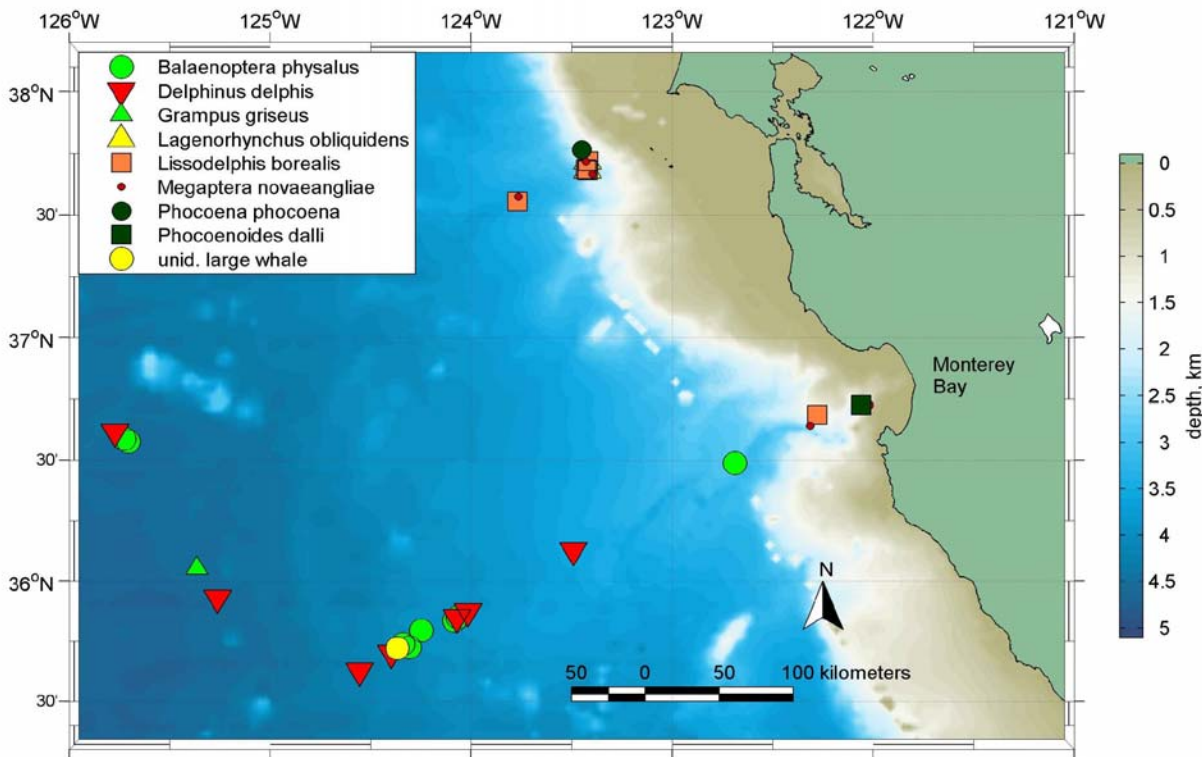


Figure 7. Marine mammal sightings during the PaCOOS cruise of November 2007.

Ancillary Observations:

Underway Data: Near surface measurements of temperature and salinity were recorded throughout the cruise from water pumped through the ship's uncontaminated seawater system. These data, along with meteorological data (barometric pressure, wind, etc.) collected from

various sensors mounted primarily on the ship's mast, were recorded at approximately 30-second intervals throughout the cruise. Table A1 lists these data at the start of each hydrographic station.

Satellite Imagery: Advanced Very High Resolution Radiometer (AVHRR) satellite imagery of sea surface temperature of the area of operation soon after the conclusion of the PaCOOS cruise is included as Figure 8. Conditions were never sufficiently clear to obtain a good satellite image during the time of the PaCOOS cruise.

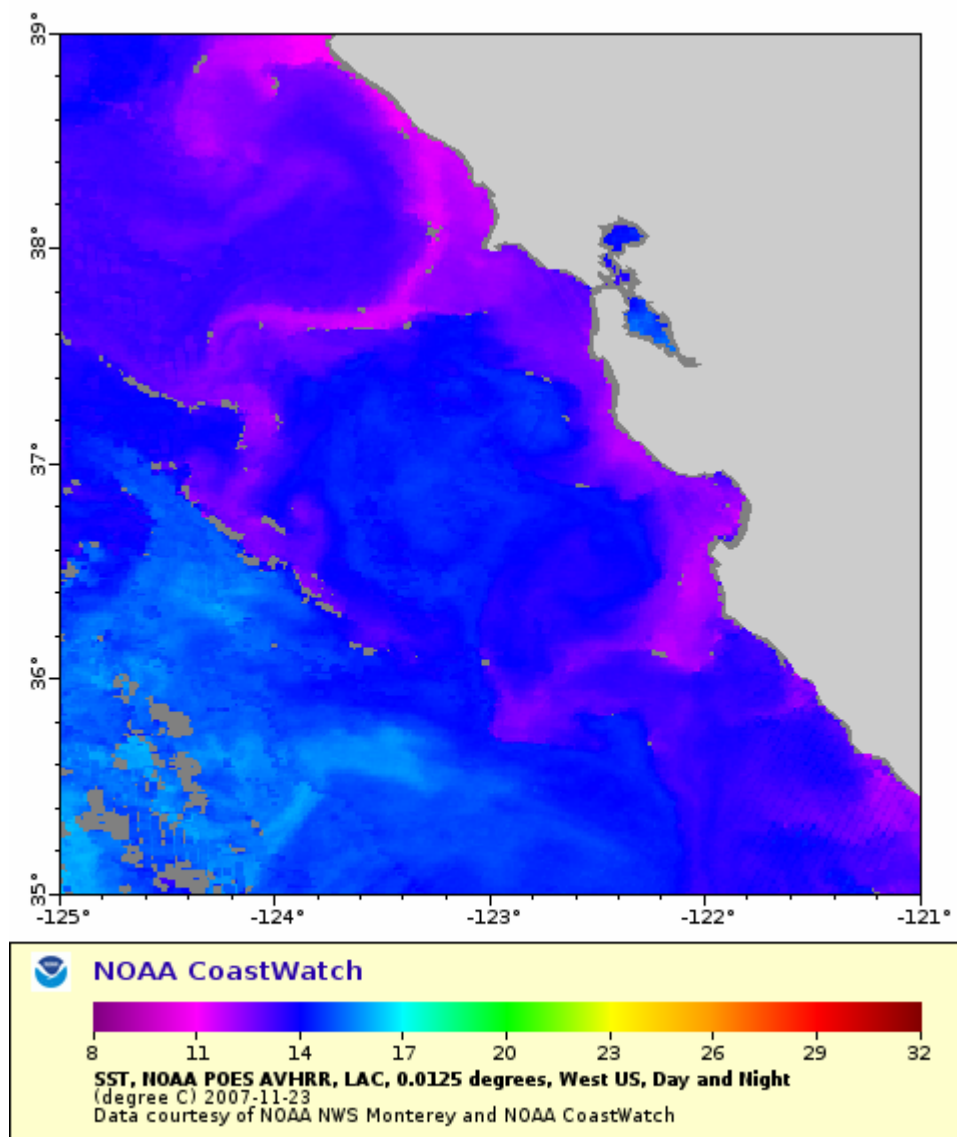


Figure 8. Advanced Very High Resolution Radiometer (AVHRR) satellite image of sea surface temperature ($^{\circ}\text{C}$) of the area of operation during the PaCOOS cruise of November 2007. The image was taken on 23 November 2007.

ADCP: Continuous ocean current measurements were made throughout the cruise using a vessel-mounted RD Instruments 150 kHz broadband Acoustic Doppler Current Profiler (ADCP), model VM-150-18HP. Some results from the ADCP are shown in Figure 9.

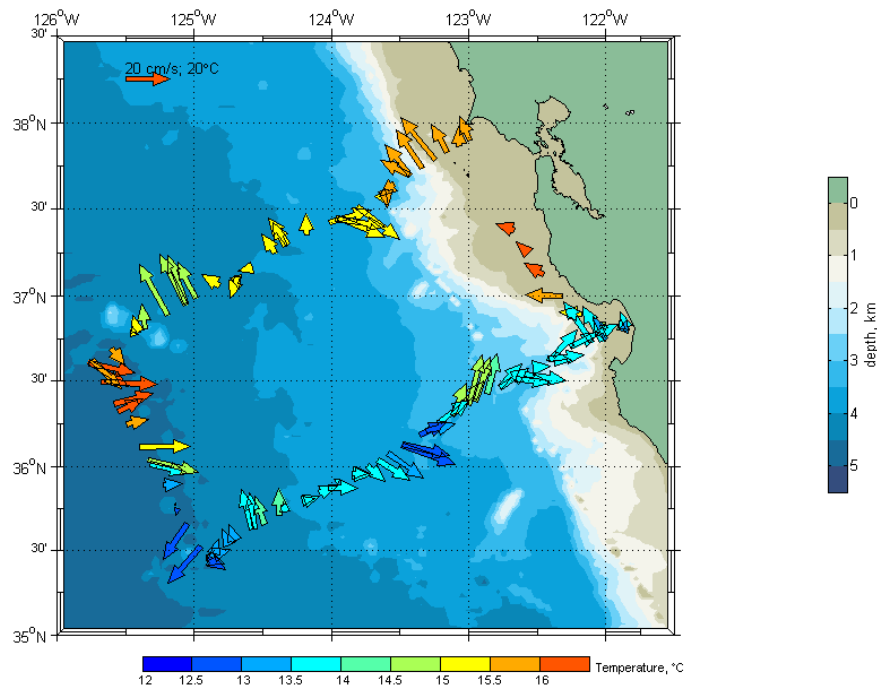


Figure 9. ADCP results from the PaCOOS cruise of November 2007. The arrows are current vectors for currents averaged between 48 and 102 m. The colors of the current vectors reflect the sea surface temperature as measured by the ship's underway data acquisition system.

Tabulated Data (in Appendix A)

The following tables of data can be found in Appendix A:

1) **Table A1: Meteorological and Sea Surface Data**

This lists the meteorological and surface oceanographic conditions at the start of each hydrographic station as measured by the underway data acquisition system of the *NOAA Ship David Starr Jordan*.

2) **Table A2: Hydrographic Data**

This is a chronological listing of the hydrographic data collected at each CTD station during the cruise. Data are given for standard pressures, except that the last line of data for each site is the deepest pressure for that CTD cast. The surface pressure, listed as 0 dbar, is actually 1 dbar. Salinities (oxygen) have been adjusted according to the conductivity/salinity (oxygen) calibration correction determined from the collected salinity (oxygen/Winkler) water samples, while transmissivities have been adjusted as described previously in this report. The time listed for each station is the beginning (UT) of the CTD cast. Units of geopotential anomaly ($\Delta\Phi$), potential density (σ_θ), and potential spiciness (π_θ) are m^2s^{-2} , kg m^{-3} , and kg m^{-3} , respectively.

3) **Table A3: Nutrient and Primary Productivity Data**

This is a chronological listing of the results of the nutrient and primary productivity analyses of the water samples collected from the 12 Niskin bottles

tripped at each hydrographic station. The time given is the start (UT) for each hydrographic station. Except where primary productivity analyses were not performed (see Introduction), the data for each hydrographic station are separated into two sections (“Physical and Chemical” and “Biological”).

The physical oceanographic properties listed in the first seven columns of the “Physical and Chemical” section of each station’s data are the uncorrected values measured by the CTD at the times each Niskin bottle was tripped. Because they are uncorrected, these values may differ slightly from those listed in Table A2. The last four columns of this section of each station’s data give the nitrate (NO₃), nitrite (NO₂), phosphate (PO₄), and dissolved silicate (SiO₄) concentrations (determined as described previously).

The “Biological” section of each station’s data gives the results of the primary productivity analyses. As stated above, primary productivity sampling was not undertaken at every hydrographic station.

4) *Table A4: Marine Mammal Data*

This table lists the results of the marine mammal observations made during the cruise. The data are listed alphabetically by species, then chronologically within each species.

5) *Table A5: Marine Mammal Data Summary*

This table summarizes the (more specific) results from Table A4 of the marine mammal observations made during the cruise. The data are listed alphabetically by species.

Figures of Results (in Appendix B)

Graphical representations of the data collected during this cruise follow the tabulated data in Appendix A. Figure 10 is a series of four diagrams contouring (a) the temperature (°C), (b) the salinity, (c) the density anomaly (kg m⁻³), and (d) the oxygen (μmol kg⁻¹) fields along the line of hydrographic stations from Moss Landing to Drake’s Bay, California. The two blue lines in each diagram indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23).

Figure 11 contours the fluorescence and transmissivity in the upper 100 meters of the water column along the line of hydrographic stations from Moss Landing to Drake’s Bay, California. Again, the blue lines indicate the locations of the corner hydrographic stations.

Figure 12 is a series of four diagrams contouring (a) the nitrate (μM), (b) nitrite (μM), (c) phosphate (μM), and (d) silicate (μM) fields along the line of hydrographic stations from Moss Landing to Drake’s Bay, California. The white lines indicate the locations of the corner hydrographic stations.

Cruise Participants

| Personnel | Duties | Affiliation |
|----------------------------------|---|--|
| Tim Pennington | Nutrients, Primary Productivity | Monterey Bay Aquarium Research Institute |
| <i>Marguerite Blum</i> | <i>Nutrients, Primary Productivity, Oxygens</i> | |
| Erich Rienecker | Nutrients | |
| Curt Collins | Physical Oceanography | Naval Postgraduate School |
| <i>Tarry Rago</i> | <i>Physical Oceanography</i> | |
| Katherine Whitaker | Marine Mammal Observer | |
| Baldo Marinovic (Chief Sci.) | Phytoplankton Net Tows | University of California, Santa Cruz |
| <i>Eric Ettner</i> | <i>Phytoplankton Net Tows</i> | |
| Laura Minnis | Nutrients | MATE Program |
| <i>Lauren (Ku'u lei) Vickery</i> | <i>Nutrients</i> | |
| Rachel Stern | Nutrients | |
| Scott Hiller | Physical Oceanography | University of California, San Diego |

Literature Cited

- Chavez, F. P., R. T. Barber, A. Huyer, P. M. Kosro, S. R. Ramp, T. Stanton, and B. Rojas de Mendiola, Horizontal advection and the distribution of nutrients in the coastal transition zone off northern California: effects on primary production, phytoplankton biomass and species composition, *J. Geophys. Res.*, **96**, 14833-14848, 1991.
- Collins, C. A., J. T. Pennington, C. G. Castro, T. A. Rago, and F. P. Chavez, The California Current system off Monterey, California: physical and biological coupling, *Deep-Sea Res. II*, **50**, 2389-2404, 2003.
- Holm-Hansen, O., C. J. Lorenzen, R. W. Holmes, and J. D. H. Strickland, Fluorometric determination of chlorophyll, *J. Cons. Perm. Int. Explor. Mer*, **30**, 3-15, 1965.
- Kramer, D., M. J. Kalin, E. G. Stevens, J. R. Thrailkill, and J. R. Zweifel, Collecting and processing data on fish eggs and larvae in the California Current region, *NOAA Tech. Rep. NMFS CIRC-370*, 38 pp., Seattle, WA, 1972.
- Owens, W. B., and R. C. Millard Jr., A new algorithm for CTD oxygen calibration, *J. Phys. Oceanogr.*, **15**, 621-631, 1985.
- Parsons, T. R., Y. Maita, and C. M. Lalli, A manual of chemical and biological methods for seawater analysis, 173 pp., Pergamon Press, New York, 1984.
- Pennington, J. T., and F. P. Chavez, Seasonal fluctuations of temperature, salinity, nitrate, chlorophyll and primary production at station H3/M1 over 1989-1996 in Monterey Bay, California, *Deep-Sea Res. II*, **47**, 947-973, 2000.
- Rago, T. A., R. Michisaki, B. Marinovic, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in October 2005, *NPS Tech. Rep. No. NPS-OC-06-001*, 75 pp., 2006.
- Rago, T. A., R. Michisaki, B. Marinovic, M. Blum, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in June/July 2006, *NPS Tech. Rep. No. NPS-OC-07-001*, 79 pp., 2007a.
- Rago, T. A., R. Michisaki, B. Marinovic, M. Blum, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in October 2006, *NPS Tech. Rep. No. NPS-OC-07-002*, 93 pp., 2007b.
- Rago, T. A., R. Michisaki, B. Marinovic, M. Blum, and K. Whitaker, Physical, nutrient, and biological measurements of coastal waters off central California in June 2007, *NPS Tech. Rep. No. NPS-OC-07-008*, 87 pp., 2007c.
- Sakamoto, C. M., G. E. Friederich, and L. A. Codispoti, MBARI procedures for automated nutrient analyses using a modified Alpkem Series 300 Rapid Flow Analyzer, *MBARI Tech. Rep. No. 90-2*, 84 pp., 1990.
- Steger, J. M., F. B. Schwing, C. A. Collins, L. K. Rosenfeld, N. Garfield, and E. Gezgin, The circulation and water masses in the Gulf of the Farallones, *Deep-Sea Res. II*, **47**, 907-946, 2000.

UNESCO, Background papers and supporting data on the Practical Salinity Scale, 1978, *UNESCO Tech. Pap. In Mar. Sci.*, No. 37, 1981.

Venrick, E. L., and T. L. Hayward, Determining chlorophyll on the 1984 CalCOFI surveys, *CalCOFI Rep.* 25, 74-78, 1984.

Appendix A

Table A1: *Meteorological and sea surface data collected during the PaCOOS cruise of November 2007.* Listed here are the meteorological and surface oceanographic conditions as measured by the underway data acquisition system (UDAS) of the *NOAA Ship David Starr Jordan* at the beginning of each hydrographic station. Continuous measurements of the water being pumped through the ship's uncontaminated seawater system ("sea chest") from approximately 3 meters below the surface supplied the oceanographic data, while instrumentation atop the ship's mast supplied the meteorological data. The sea surface salinity (SSS) was adjusted higher (by 0.211) to bring the UDAS values in line with the 3-meter CTD salinity values.

| Station | Yearday, 2007 (UTC) | Barometric Pressure (mb) | Wind Speed (kts) | Wind Direction (°T) | Air Temp. (°C) | SST (°C) | SSS |
|---------|---------------------------|--------------------------------|------------------------|---------------------------|----------------------|-------------|--------|
| 0 | 310.1188 | 1017.15 | 4.42 | 239.64 | 11.2 | 13.110 | 33.084 |
| 1 | 310.5125 | 1016.82 | 2.85 | 049.71 | 10.7 | 12.099 | 33.532 |
| 2 | 310.6104 | 1016.14 | 3.87 | 052.46 | 10.8 | 13.048 | 33.285 |
| 3 | 310.7278 | 1017.49 | 3.40 | 322.16 | 12.1 | 15.529 | 33.085 |
| 4 | 310.8243 | 1016.82 | 3.57 | 328.39 | 12.0 | 15.694 | 32.942 |
| 5 | 310.9583 | 1015.46 | 7.79 | 355.27 | 12.0 | 15.880 | 32.942 |
| 6 | 311.0556 | 1015.46 | 7.39 | 344.67 | 11.8 | 15.638 | 32.963 |
| 7 | 311.1750 | 1016.48 | 6.52 | 341.64 | 12.0 | 14.210 | 32.957 |
| 8 | 311.2708 | 1017.49 | 7.92 | 004.68 | 12.2 | 14.579 | 33.131 |
| 9 | 311.3847 | 1017.15 | 8.47 | 354.90 | 12.5 | 14.920 | 33.116 |
| 10 | 311.4750 | 1016.82 | 7.05 | 347.59 | 12.6 | 14.702 | 32.809 |
| 11 | 311.5854 | 1017.15 | 3.85 | 355.69 | 12.5 | 14.937 | 32.716 |
| 12 | 311.6799 | 1018.17 | 2.05 | 000.23 | 12.7 | 15.022 | 32.673 |
| 13 | 311.7938 | 1018.85 | 0.54 | 154.70 | 13.1 | 15.217 | 32.692 |
| 14 | 311.8833 | 1017.49 | 3.02 | 177.84 | 13.5 | 14.844 | 32.826 |
| 15 | 311.9917 | 1017.49 | 1.60 | 142.69 | 13.7 | 15.665 | 33.005 |
| 16 | 312.0833 | 1017.49 | 0.13 | 256.15 | 13.7 | 15.413 | 32.847 |
| 17 | 312.1965 | 1018.17 | 5.15 | 136.15 | 14.6 | 15.186 | 32.885 |
| 18 | 312.2917 | 1017.83 | 8.32 | 131.14 | 14.5 | 15.644 | 33.031 |
| 19 | 312.3931 | 1017.15 | 7.55 | 146.85 | 15.0 | 15.647 | 33.034 |
| 20 | 312.5139 | 1016.82 | 9.34 | 188.83 | 14.9 | 15.265 | 32.685 |
| 21 | 312.6569 | 1016.82 | 6.45 | 162.66 | 14.9 | 14.969 | 32.702 |
| 22 | 312.8028 | 1016.48 | 7.42 | 150.14 | 15.1 | 15.026 | 32.743 |
| 23 | 312.9361 | 1014.45 | 6.71 | 101.48 | 14.4 | 14.107 | 32.709 |
| 24 | 313.1097 | 1014.45 | 7.05 | 092.85 | 14.5 | 14.833 | 32.873 |
| 25 | 313.2694 | 1015.12 | 8.29 | 122.63 | 14.8 | 14.927 | 32.917 |
| 26 | 313.4292 | 1014.78 | 7.00 | 119.33 | 13.9 | 13.295 | 32.769 |
| 27 | 313.5847 | 1014.78 | 5.18 | 093.48 | 14.1 | 13.598 | 33.184 |
| 28 | 313.7451 | 1016.14 | 4.77 | 078.42 | 14.3 | 13.873 | 33.194 |
| 29 | 313.9063 | 1015.80 | 5.28 | 091.69 | 13.7 | 13.703 | 33.029 |
| 30 | 314.0132 | 1016.14 | 3.28 | 176.63 | 13.7 | 13.464 | 33.151 |
| 31 | 314.1299 | 1016.82 | 2.46 | 111.40 | 12.8 | 12.835 | 33.354 |
| 32 | 314.2125 | 1017.15 | 2.79 | 122.91 | 12.6 | 12.737 | 33.300 |
| 33 | 314.2972 | 1017.15 | 5.62 | 113.89 | 13.0 | 13.278 | 33.208 |

Table A2: *List at standard pressures of hydrographic data collected during the PaCOOS cruise of November 2007. Stations are in chronological order, starting with station 0 that was collected outside of San Francisco Bay. For each cast, the surface pressure (listed as 0 dbar) is actually 1 dbar, while the last pressure is the deepest pressure of the cast. Salinities and oxygens have been adjusted according to the calibration corrections determined from the collected salinity and oxygen water samples, while transmissivities have been adjusted as described earlier in this report. The time listed for each station is the beginning (<mm/dd/yyyy, hhmm> UT) of the CTD cast. Units of geopotential anomaly ($\Delta\Phi$), potential density (σ_θ), and potential spiciness (π_θ) are m^2s^{-2} , kg m^{-3} , and kg m^{-3} , respectively.*

Station: 0 **Date:** 11/06/2007, 0251 **Lat.:** 37° 42.50 N **Long.:** 122° 38.72 W

| P(dbar) | T(°C) | S | O ₂ ($\mu\text{mol/kg}$) | Xmiss(%) | $\Delta\Phi$ | σ_θ | π_θ |
|---------|--------|--------|---------------------------------------|----------|--------------|-----------------|--------------|
| 0 | 13.102 | 33.091 | 327.2 | 76.7 | 0.030 | 24.894 | 0.211 |
| 10 | 12.684 | 33.108 | 260.8 | 77.0 | 0.304 | 24.990 | 0.140 |
| 20 | 10.497 | 33.690 | 134.6 | 79.5 | 0.551 | 25.844 | 0.189 |
| 23 | 10.380 | 33.725 | 107.6 | 73.7 | 0.615 | 25.892 | 0.196 |

Station: 1 **Date:** 11/06/2007, 1218 **Lat.:** 36° 47.85 N **Long.:** 121° 50.96 W

| P(dbar) | T(°C) | S | O ₂ ($\mu\text{mol/kg}$) | Xmiss(%) | $\Delta\Phi$ | σ_θ | π_θ |
|---------|--------|--------|---------------------------------------|----------|--------------|-----------------|--------------|
| 0 | 12.071 | 33.557 | 278.1 | 75.9 | 0.025 | 25.455 | 0.376 |
| 10 | 12.079 | 33.557 | 280.4 | 75.0 | 0.252 | 25.454 | 0.377 |
| 20 | 12.045 | 33.559 | 274.1 | 78.6 | 0.503 | 25.462 | 0.372 |
| 30 | 11.848 | 33.539 | 259.8 | 85.3 | 0.754 | 25.484 | 0.318 |
| 50 | 10.858 | 33.658 | 175.9 | 87.3 | 1.219 | 25.757 | 0.228 |
| 75 | 10.692 | 33.714 | 164.6 | 86.6 | 1.766 | 25.830 | 0.242 |
| 100 | 10.526 | 33.726 | 161.6 | 87.2 | 2.306 | 25.869 | 0.221 |
| 125 | 10.366 | 33.728 | 158.5 | 87.7 | 2.837 | 25.899 | 0.194 |
| 150 | 10.334 | 33.784 | 143.0 | 86.1 | 3.364 | 25.948 | 0.232 |
| 200 | 9.865 | 33.859 | 117.4 | 82.9 | 4.380 | 26.088 | 0.210 |
| 234 | 9.268 | 33.940 | 95.8 | 83.3 | 5.012 | 26.249 | 0.174 |

Station: 2 Date: 11/06/2007, 1439 Lat.: 36° 44.10 N Long.: 122° 01.31 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 13.260 | 33.251 | 275.9 | 87.8 | 0.030 | 24.986 | 0.370 |
| 10 | 12.664 | 33.274 | 267.6 | 88.1 | 0.291 | 25.122 | 0.267 |
| 20 | 12.131 | 33.308 | 260.6 | 87.0 | 0.568 | 25.251 | 0.189 |
| 30 | 10.733 | 33.218 | 234.9 | 90.3 | 0.831 | 25.435 | -0.145 |
| 50 | 10.698 | 33.584 | 188.8 | 90.2 | 1.311 | 25.728 | 0.140 |
| 75 | 10.226 | 33.712 | 160.3 | 89.8 | 1.849 | 25.910 | 0.158 |
| 100 | 9.959 | 33.763 | 146.3 | 89.8 | 2.364 | 25.995 | 0.152 |
| 125 | 9.761 | 33.803 | 135.2 | 89.7 | 2.863 | 26.060 | 0.150 |
| 150 | 9.499 | 33.850 | 127.2 | 89.6 | 3.349 | 26.140 | 0.143 |
| 200 | 8.894 | 34.036 | 84.6 | 90.2 | 4.234 | 26.384 | 0.191 |
| 250 | 8.547 | 34.094 | 67.8 | 89.9 | 5.048 | 26.484 | 0.182 |
| 300 | 7.879 | 34.144 | 58.1 | 90.5 | 5.810 | 26.624 | 0.119 |
| 400 | 6.796 | 34.195 | 39.3 | 90.6 | 7.178 | 26.817 | 0.006 |
| 500 | 5.993 | 34.236 | 27.5 | 89.9 | 8.416 | 26.955 | -0.068 |
| 600 | 5.321 | 34.288 | 23.2 | 88.6 | 9.516 | 27.079 | -0.109 |
| 700 | 4.765 | 34.347 | 17.4 | 89.7 | 10.511 | 27.191 | -0.126 |
| 800 | 4.392 | 34.394 | 18.9 | 89.3 | 11.412 | 27.269 | -0.130 |
| 900 | 4.091 | 34.427 | 23.2 | 88.8 | 12.263 | 27.328 | -0.136 |
| 1000 | 3.730 | 34.465 | 28.4 | 88.3 | 13.066 | 27.395 | -0.144 |
| 1020 | 3.683 | 34.469 | 29.4 | 88.5 | 13.218 | 27.403 | -0.145 |

Station: 3 Date: 11/06/2007, 1728 Lat.: 36° 42.73 N Long.: 122° 14.10 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.534 | 33.102 | 263.9 | 87.1 | 0.035 | 24.392 | 0.747 |
| 10 | 15.534 | 33.101 | 265.0 | 87.1 | 0.353 | 24.392 | 0.746 |
| 20 | 15.490 | 33.103 | 263.7 | 87.4 | 0.706 | 24.403 | 0.737 |
| 30 | 13.881 | 33.191 | 272.9 | 88.7 | 1.034 | 24.815 | 0.452 |
| 50 | 13.296 | 33.232 | 273.1 | 89.2 | 1.641 | 24.966 | 0.362 |
| 75 | 10.126 | 33.413 | 204.2 | 90.7 | 2.321 | 25.693 | -0.097 |
| 100 | 9.268 | 33.615 | 176.5 | 90.9 | 2.862 | 25.993 | -0.081 |
| 125 | 9.133 | 33.853 | 131.7 | 91.0 | 3.343 | 26.201 | 0.086 |
| 150 | 8.848 | 33.950 | 115.8 | 91.0 | 3.788 | 26.323 | 0.116 |
| 200 | 8.443 | 34.049 | 100.5 | 91.1 | 4.611 | 26.463 | 0.130 |
| 250 | 7.892 | 34.068 | 88.9 | 91.2 | 5.384 | 26.561 | 0.062 |
| 300 | 7.622 | 34.146 | 61.8 | 91.2 | 6.113 | 26.663 | 0.084 |
| 400 | 6.593 | 34.184 | 38.4 | 91.2 | 7.441 | 26.836 | -0.030 |
| 500 | 6.125 | 34.239 | 24.5 | 91.3 | 8.663 | 26.941 | -0.048 |
| 600 | 5.232 | 34.247 | 18.3 | 91.2 | 9.782 | 27.057 | -0.151 |
| 700 | 4.795 | 34.335 | 12.7 | 91.1 | 10.787 | 27.177 | -0.133 |
| 800 | 4.479 | 34.384 | 13.7 | 91.1 | 11.713 | 27.252 | -0.129 |
| 900 | 4.156 | 34.423 | 17.9 | 90.3 | 12.575 | 27.318 | -0.133 |
| 1000 | 3.795 | 34.463 | 22.8 | 90.8 | 13.376 | 27.388 | -0.138 |
| 1006 | 3.787 | 34.465 | 22.9 | 90.8 | 13.422 | 27.390 | -0.138 |

Station: 4 Date: 11/06/2007, 1947 Lat.: 36° 37.69 N Long.: 122° 25.19 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.700 | 32.955 | 262.4 | 87.7 | 0.037 | 24.242 | 0.669 |
| 10 | 15.691 | 32.955 | 263.8 | 87.6 | 0.367 | 24.244 | 0.666 |
| 20 | 14.375 | 32.918 | 272.8 | 87.6 | 0.727 | 24.501 | 0.342 |
| 30 | 13.483 | 33.078 | 273.9 | 88.5 | 1.053 | 24.809 | 0.279 |
| 50 | 11.632 | 33.054 | 256.8 | 90.0 | 1.652 | 25.147 | -0.110 |
| 75 | 11.032 | 33.555 | 196.3 | 90.7 | 2.279 | 25.646 | 0.177 |
| 100 | 9.638 | 33.623 | 174.3 | 91.0 | 2.830 | 25.939 | -0.013 |
| 125 | 9.113 | 33.825 | 147.8 | 91.0 | 3.317 | 26.183 | 0.060 |
| 150 | 8.558 | 33.899 | 137.8 | 91.1 | 3.757 | 26.327 | 0.030 |
| 200 | 8.056 | 34.002 | 112.9 | 91.1 | 4.572 | 26.485 | 0.035 |
| 250 | 7.649 | 34.067 | 83.6 | 91.2 | 5.333 | 26.596 | 0.026 |
| 300 | 7.186 | 34.102 | 63.5 | 91.2 | 6.049 | 26.690 | -0.013 |
| 400 | 6.543 | 34.188 | 38.4 | 91.2 | 7.369 | 26.846 | -0.033 |
| 500 | 5.741 | 34.206 | 27.4 | 91.2 | 8.572 | 26.963 | -0.122 |
| 600 | 5.345 | 34.292 | 16.4 | 91.3 | 9.669 | 27.079 | -0.103 |
| 700 | 4.895 | 34.338 | 13.0 | 91.3 | 10.677 | 27.168 | -0.119 |
| 800 | 4.502 | 34.375 | 13.2 | 91.3 | 11.614 | 27.242 | -0.134 |
| 900 | 4.165 | 34.422 | 15.9 | 91.3 | 12.483 | 27.316 | -0.133 |
| 1000 | 3.863 | 34.452 | 20.1 | 91.3 | 13.295 | 27.372 | -0.141 |
| 1007 | 3.845 | 34.454 | 20.6 | 91.3 | 13.350 | 27.375 | -0.141 |

Station: 5 Date: 11/06/2007, 2300 Lat.: 36° 32.66 N Long.: 122° 35.91 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.878 | 32.944 | 164.8 | 88.0 | 0.037 | 24.194 | 0.701 |
| 10 | 15.880 | 32.950 | 203.6 | 88.0 | 0.372 | 24.198 | 0.706 |
| 20 | 14.731 | 32.869 | 269.3 | 87.0 | 0.740 | 24.388 | 0.381 |
| 30 | 14.346 | 32.883 | 273.3 | 87.9 | 1.090 | 24.480 | 0.307 |
| 50 | 12.759 | 33.039 | 272.6 | 89.1 | 1.726 | 24.922 | 0.098 |
| 75 | 10.704 | 33.132 | 238.0 | 90.6 | 2.431 | 25.375 | -0.219 |
| 100 | 9.945 | 33.602 | 184.2 | 90.9 | 3.022 | 25.871 | 0.021 |
| 125 | 9.355 | 33.759 | 151.6 | 91.0 | 3.531 | 26.092 | 0.047 |
| 150 | 8.694 | 33.890 | 135.7 | 91.1 | 3.983 | 26.299 | 0.045 |
| 200 | 8.147 | 33.999 | 118.6 | 91.1 | 4.811 | 26.469 | 0.046 |
| 250 | 7.450 | 34.034 | 102.6 | 91.1 | 5.577 | 26.599 | -0.029 |
| 300 | 7.090 | 34.092 | 65.9 | 91.2 | 6.287 | 26.695 | -0.034 |
| 400 | 6.252 | 34.119 | 41.9 | 91.3 | 7.592 | 26.829 | -0.126 |
| 500 | 5.557 | 34.192 | 28.2 | 91.3 | 8.770 | 26.974 | -0.155 |
| 600 | 4.954 | 34.249 | 17.2 | 91.3 | 9.848 | 27.090 | -0.182 |
| 700 | 4.911 | 34.364 | 13.0 | 91.2 | 10.837 | 27.187 | -0.097 |
| 800 | 4.551 | 34.401 | 14.5 | 91.2 | 11.761 | 27.258 | -0.108 |
| 900 | 4.239 | 34.433 | 17.5 | 91.3 | 12.623 | 27.317 | -0.117 |
| 1000 | 3.915 | 34.456 | 21.4 | 91.3 | 13.435 | 27.370 | -0.132 |
| 1006 | 3.904 | 34.456 | 21.5 | 91.3 | 13.482 | 27.371 | -0.133 |

Station: 6 Date: 11/07/2007, 0120 Lat.: 36° 27.61 N Long.: 122° 46.65 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.616 | 32.968 | 262.6 | 87.9 | 0.036 | 24.271 | 0.660 |
| 10 | 15.634 | 32.970 | 263.6 | 87.9 | 0.365 | 24.268 | 0.665 |
| 20 | 14.430 | 33.009 | 271.6 | 88.5 | 0.713 | 24.560 | 0.426 |
| 30 | 13.636 | 32.997 | 273.6 | 89.2 | 1.042 | 24.715 | 0.246 |
| 50 | 13.349 | 33.106 | 269.9 | 89.9 | 1.667 | 24.858 | 0.272 |
| 75 | 10.635 | 33.109 | 240.4 | 90.8 | 2.381 | 25.369 | -0.251 |
| 100 | 9.967 | 33.422 | 201.6 | 91.0 | 2.988 | 25.728 | -0.117 |
| 125 | 9.088 | 33.717 | 155.8 | 91.0 | 3.505 | 26.102 | -0.030 |
| 150 | 8.733 | 33.875 | 137.2 | 91.1 | 3.967 | 26.281 | 0.038 |
| 200 | 8.360 | 34.026 | 116.7 | 91.2 | 4.799 | 26.458 | 0.099 |
| 250 | 7.608 | 34.029 | 111.0 | 91.2 | 5.568 | 26.572 | -0.011 |
| 300 | 6.879 | 34.053 | 76.9 | 91.2 | 6.285 | 26.693 | -0.094 |
| 400 | 6.016 | 34.128 | 43.1 | 91.3 | 7.583 | 26.866 | -0.148 |
| 500 | 5.512 | 34.202 | 25.7 | 91.3 | 8.756 | 26.987 | -0.153 |
| 600 | 4.848 | 34.239 | 17.5 | 91.3 | 9.831 | 27.094 | -0.201 |
| 700 | 4.665 | 34.334 | 12.9 | 91.3 | 10.816 | 27.191 | -0.148 |
| 800 | 4.468 | 34.399 | 14.5 | 91.3 | 11.726 | 27.265 | -0.118 |
| 900 | 4.170 | 34.440 | 18.5 | 91.2 | 12.582 | 27.330 | -0.118 |
| 1000 | 3.892 | 34.462 | 22.4 | 91.3 | 13.388 | 27.377 | -0.129 |
| 1011 | 3.874 | 34.466 | 23.0 | 91.3 | 13.474 | 27.382 | -0.128 |

Station: 7 Date: 11/07/2007, 0412 Lat.: 36° 22.81 N Long.: 122° 57.13 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.210 | 32.965 | 271.5 | 87.6 | 0.034 | 24.571 | 0.344 |
| 10 | 14.451 | 33.082 | 271.0 | 88.5 | 0.335 | 24.611 | 0.489 |
| 20 | 14.395 | 33.148 | 268.1 | 89.2 | 0.664 | 24.674 | 0.528 |
| 30 | 13.289 | 33.015 | 266.8 | 89.6 | 0.985 | 24.799 | 0.188 |
| 50 | 10.086 | 32.815 | 261.1 | 90.4 | 1.564 | 25.233 | -0.582 |
| 75 | 9.659 | 33.260 | 219.5 | 90.9 | 2.197 | 25.652 | -0.299 |
| 100 | 9.619 | 33.679 | 160.3 | 91.0 | 2.736 | 25.986 | 0.028 |
| 125 | 8.866 | 33.840 | 143.0 | 91.0 | 3.219 | 26.233 | 0.033 |
| 150 | 8.611 | 33.956 | 129.1 | 91.1 | 3.652 | 26.364 | 0.083 |
| 200 | 7.879 | 34.012 | 120.4 | 91.2 | 4.454 | 26.519 | 0.016 |
| 250 | 7.379 | 34.040 | 100.0 | 91.2 | 5.201 | 26.613 | -0.034 |
| 300 | 7.037 | 34.090 | 66.8 | 91.3 | 5.907 | 26.700 | -0.044 |
| 400 | 6.095 | 34.131 | 43.2 | 91.3 | 7.207 | 26.858 | -0.136 |
| 500 | 5.591 | 34.235 | 22.2 | 91.3 | 8.375 | 27.004 | -0.117 |
| 600 | 4.989 | 34.286 | 15.1 | 91.3 | 9.435 | 27.116 | -0.148 |
| 700 | 4.535 | 34.323 | 12.6 | 91.3 | 10.407 | 27.197 | -0.170 |
| 800 | 4.407 | 34.411 | 15.5 | 91.3 | 11.305 | 27.281 | -0.116 |
| 900 | 4.103 | 34.435 | 18.5 | 91.3 | 12.146 | 27.333 | -0.129 |
| 1000 | 3.894 | 34.459 | 22.0 | 91.3 | 12.950 | 27.374 | -0.132 |
| 1025 | 3.855 | 34.467 | 23.5 | 91.3 | 13.146 | 27.385 | -0.130 |

Station: 8 Date: 11/07/2007, 0630 Lat.: 36° 17.76 N Long.: 123° 07.72 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.582 | 33.139 | 270.5 | 86.9 | 0.033 | 24.627 | 0.563 |
| 10 | 14.588 | 33.139 | 271.8 | 86.9 | 0.330 | 24.626 | 0.564 |
| 20 | 14.591 | 33.139 | 272.1 | 86.9 | 0.661 | 24.626 | 0.564 |
| 30 | 14.573 | 33.160 | 269.8 | 88.6 | 0.992 | 24.646 | 0.577 |
| 50 | 11.617 | 33.331 | 228.8 | 90.0 | 1.595 | 25.366 | 0.109 |
| 75 | 10.228 | 33.519 | 187.6 | 90.6 | 2.192 | 25.759 | 0.005 |
| 100 | 9.335 | 33.769 | 141.4 | 90.8 | 2.708 | 26.102 | 0.052 |
| 125 | 8.650 | 33.887 | 139.0 | 91.0 | 3.163 | 26.303 | 0.035 |
| 150 | 8.357 | 33.965 | 126.7 | 91.0 | 3.586 | 26.410 | 0.052 |
| 200 | 7.873 | 34.020 | 98.1 | 91.2 | 4.378 | 26.526 | 0.022 |
| 250 | 7.329 | 34.038 | 92.8 | 91.2 | 5.125 | 26.619 | -0.043 |
| 300 | 6.683 | 34.041 | 84.2 | 91.2 | 5.830 | 26.709 | -0.130 |
| 400 | 6.053 | 34.140 | 40.8 | 91.3 | 7.125 | 26.871 | -0.134 |
| 500 | 5.219 | 34.165 | 29.4 | 91.3 | 8.292 | 26.993 | -0.217 |
| 600 | 5.206 | 34.310 | 14.4 | 91.3 | 9.357 | 27.110 | -0.105 |
| 700 | 4.665 | 34.341 | 12.8 | 91.3 | 10.334 | 27.197 | -0.142 |
| 800 | 4.416 | 34.406 | 14.9 | 91.3 | 11.235 | 27.276 | -0.119 |
| 900 | 4.170 | 34.449 | 19.5 | 91.3 | 12.078 | 27.337 | -0.111 |
| 1000 | 3.858 | 34.470 | 23.9 | 91.3 | 12.871 | 27.387 | -0.127 |
| 1019 | 3.792 | 34.475 | 25.0 | 91.3 | 13.017 | 27.397 | -0.130 |

Station: 9 Date: 11/07/2007, 0914 Lat.: 36° 12.57 N Long.: 123° 18.76 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.914 | 32.995 | 267.8 | 86.6 | 0.035 | 24.445 | 0.522 |
| 10 | 14.918 | 33.126 | 268.4 | 86.8 | 0.341 | 24.546 | 0.627 |
| 20 | 14.925 | 33.130 | 268.8 | 86.9 | 0.680 | 24.547 | 0.631 |
| 30 | 14.855 | 33.166 | 263.8 | 89.0 | 1.017 | 24.590 | 0.643 |
| 50 | 10.969 | 32.824 | 269.0 | 89.7 | 1.634 | 25.087 | -0.418 |
| 75 | 9.688 | 33.197 | 223.2 | 90.8 | 2.307 | 25.598 | -0.344 |
| 100 | 9.989 | 33.736 | 154.0 | 90.9 | 2.851 | 25.969 | 0.136 |
| 125 | 9.190 | 33.828 | 128.0 | 90.9 | 3.340 | 26.172 | 0.075 |
| 150 | 8.781 | 33.932 | 111.8 | 90.8 | 3.786 | 26.319 | 0.092 |
| 200 | 8.147 | 34.046 | 91.2 | 91.1 | 4.599 | 26.506 | 0.083 |
| 250 | 7.245 | 34.030 | 83.4 | 91.1 | 5.346 | 26.624 | -0.061 |
| 300 | 6.623 | 34.030 | 78.3 | 91.2 | 6.050 | 26.709 | -0.146 |
| 400 | 5.819 | 34.096 | 50.9 | 91.2 | 7.353 | 26.865 | -0.198 |
| 500 | 5.350 | 34.208 | 23.4 | 91.3 | 8.517 | 27.011 | -0.168 |
| 600 | 4.834 | 34.276 | 15.0 | 91.3 | 9.568 | 27.125 | -0.174 |
| 700 | 4.733 | 34.371 | 13.1 | 91.3 | 10.524 | 27.213 | -0.111 |
| 800 | 4.405 | 34.415 | 15.7 | 91.3 | 11.420 | 27.284 | -0.113 |
| 900 | 4.127 | 34.447 | 19.5 | 91.2 | 12.255 | 27.340 | -0.117 |
| 1000 | 3.819 | 34.481 | 26.0 | 91.3 | 13.042 | 27.399 | -0.122 |
| 1007 | 3.785 | 34.482 | 26.5 | 91.3 | 13.095 | 27.404 | -0.124 |

Station: 10 Date: 11/07/2007, 1124 Lat.: 36° 07.62 N Long.: 123° 29.38 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.699 | 32.814 | 268.5 | 87.5 | 0.036 | 24.352 | 0.331 |
| 10 | 14.698 | 32.814 | 269.2 | 88.1 | 0.357 | 24.352 | 0.330 |
| 20 | 14.581 | 32.836 | 270.4 | 88.4 | 0.712 | 24.394 | 0.321 |
| 30 | 14.041 | 32.796 | 273.2 | 88.7 | 1.062 | 24.477 | 0.172 |
| 50 | 12.336 | 32.797 | 270.9 | 89.5 | 1.724 | 24.816 | -0.179 |
| 75 | 10.051 | 32.874 | 256.0 | 90.7 | 2.437 | 25.285 | -0.541 |
| 100 | 9.768 | 33.365 | 206.6 | 90.8 | 3.062 | 25.716 | -0.197 |
| 125 | 8.919 | 33.668 | 183.4 | 91.0 | 3.584 | 26.090 | -0.096 |
| 150 | 8.797 | 33.877 | 142.0 | 91.0 | 4.042 | 26.273 | 0.050 |
| 200 | 8.131 | 34.002 | 102.5 | 91.0 | 4.874 | 26.474 | 0.046 |
| 250 | 7.838 | 34.079 | 79.5 | 91.2 | 5.641 | 26.578 | 0.062 |
| 300 | 7.051 | 34.095 | 62.3 | 91.2 | 6.359 | 26.703 | -0.037 |
| 400 | 6.111 | 34.136 | 41.9 | 91.2 | 7.668 | 26.860 | -0.130 |
| 500 | 5.584 | 34.208 | 24.5 | 91.3 | 8.847 | 26.983 | -0.139 |
| 600 | 4.917 | 34.254 | 16.5 | 91.3 | 9.924 | 27.099 | -0.182 |
| 700 | 4.645 | 34.336 | 12.7 | 91.3 | 10.904 | 27.195 | -0.148 |
| 800 | 4.430 | 34.410 | 15.3 | 91.2 | 11.806 | 27.278 | -0.113 |
| 900 | 4.119 | 34.447 | 19.6 | 91.3 | 12.648 | 27.341 | -0.118 |
| 1000 | 3.813 | 34.471 | 23.9 | 91.2 | 13.437 | 27.392 | -0.131 |
| 1008 | 3.797 | 34.473 | 24.4 | 91.2 | 13.498 | 27.395 | -0.131 |

Station: 11 Date: 11/07/2007, 1403 Lat.: 36° 02.58 N Long.: 123° 40.07 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.936 | 32.716 | 266.2 | 88.8 | 0.037 | 24.226 | 0.306 |
| 10 | 14.863 | 32.757 | 268.9 | 88.3 | 0.367 | 24.273 | 0.321 |
| 20 | 14.843 | 32.769 | 269.4 | 88.5 | 0.731 | 24.287 | 0.326 |
| 30 | 14.823 | 32.779 | 269.5 | 88.7 | 1.094 | 24.299 | 0.329 |
| 50 | 11.314 | 32.664 | 285.5 | 89.9 | 1.777 | 24.902 | -0.482 |
| 75 | 10.191 | 32.739 | 269.4 | 90.7 | 2.507 | 25.156 | -0.626 |
| 100 | 9.620 | 32.995 | 240.9 | 90.9 | 3.178 | 25.451 | -0.518 |
| 125 | 9.045 | 33.413 | 213.4 | 91.0 | 3.755 | 25.870 | -0.279 |
| 150 | 8.710 | 33.779 | 184.5 | 91.0 | 4.245 | 26.210 | -0.041 |
| 200 | 8.066 | 33.986 | 116.6 | 91.1 | 5.088 | 26.471 | 0.024 |
| 250 | 7.604 | 34.060 | 80.2 | 91.2 | 5.852 | 26.597 | 0.014 |
| 300 | 7.298 | 34.105 | 64.4 | 91.2 | 6.570 | 26.677 | 0.005 |
| 400 | 6.279 | 34.127 | 45.8 | 91.2 | 7.900 | 26.831 | -0.116 |
| 500 | 5.538 | 34.183 | 28.1 | 91.3 | 9.107 | 26.969 | -0.165 |
| 600 | 4.957 | 34.240 | 17.8 | 91.3 | 10.196 | 27.083 | -0.188 |
| 700 | 4.670 | 34.322 | 12.6 | 91.3 | 11.191 | 27.181 | -0.156 |
| 800 | 4.454 | 34.410 | 15.2 | 91.2 | 12.101 | 27.275 | -0.111 |
| 900 | 4.135 | 34.439 | 18.2 | 91.2 | 12.946 | 27.333 | -0.123 |
| 1000 | 3.813 | 34.471 | 23.9 | 91.2 | 13.741 | 27.392 | -0.130 |
| 1016 | 3.775 | 34.476 | 25.1 | 91.2 | 13.864 | 27.400 | -0.131 |

Station: 12 Date: 11/07/2007, 1619 Lat.: 35° 57.55 N Long.: 123° 50.89 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.020 | 32.677 | 265.5 | 89.3 | 0.037 | 24.177 | 0.293 |
| 10 | 15.026 | 32.678 | 266.8 | 89.3 | 0.373 | 24.177 | 0.295 |
| 20 | 15.027 | 32.678 | 267.2 | 89.3 | 0.747 | 24.177 | 0.295 |
| 30 | 15.032 | 32.681 | 267.6 | 89.4 | 1.121 | 24.178 | 0.298 |
| 50 | 12.169 | 32.661 | 286.3 | 89.5 | 1.844 | 24.742 | -0.321 |
| 75 | 10.882 | 32.819 | 272.3 | 90.7 | 2.593 | 25.100 | -0.438 |
| 100 | 9.903 | 32.914 | 255.4 | 90.9 | 3.290 | 25.341 | -0.535 |
| 125 | 9.339 | 33.366 | 215.1 | 91.0 | 3.898 | 25.787 | -0.268 |
| 150 | 8.916 | 33.684 | 185.3 | 91.0 | 4.416 | 26.103 | -0.084 |
| 200 | 8.466 | 33.998 | 105.5 | 91.1 | 5.288 | 26.420 | 0.094 |
| 250 | 7.849 | 34.060 | 87.2 | 91.1 | 6.071 | 26.561 | 0.049 |
| 300 | 6.935 | 34.029 | 85.1 | 91.1 | 6.803 | 26.666 | -0.106 |
| 400 | 6.220 | 34.124 | 47.5 | 91.2 | 8.135 | 26.837 | -0.126 |
| 500 | 5.575 | 34.186 | 28.6 | 91.2 | 9.335 | 26.967 | -0.158 |
| 600 | 5.039 | 34.242 | 17.8 | 91.2 | 10.433 | 27.076 | -0.177 |
| 700 | 4.590 | 34.305 | 12.7 | 91.2 | 11.432 | 27.176 | -0.179 |
| 800 | 4.270 | 34.374 | 12.6 | 91.2 | 12.347 | 27.266 | -0.159 |
| 900 | 4.024 | 34.422 | 16.4 | 91.3 | 13.196 | 27.331 | -0.147 |
| 1000 | 3.741 | 34.450 | 20.0 | 91.3 | 13.995 | 27.382 | -0.154 |
| 1030 | 3.679 | 34.462 | 22.7 | 91.3 | 14.225 | 27.398 | -0.151 |

Station: 13 Date: 11/07/2007, 1903 Lat.: 35° 52.58 N Long.: 124° 01.33 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.211 | 32.696 | 264.5 | 88.6 | 0.038 | 24.151 | 0.351 |
| 10 | 15.209 | 32.696 | 265.8 | 88.7 | 0.376 | 24.151 | 0.350 |
| 20 | 15.202 | 32.696 | 266.0 | 88.7 | 0.752 | 24.153 | 0.348 |
| 30 | 15.052 | 32.706 | 267.3 | 89.5 | 1.125 | 24.194 | 0.322 |
| 50 | 14.152 | 33.026 | 267.7 | 89.6 | 1.840 | 24.632 | 0.189 |
| 75 | 11.212 | 32.800 | 270.0 | 90.4 | 2.611 | 25.027 | -0.392 |
| 100 | 10.303 | 32.960 | 253.0 | 90.8 | 3.308 | 25.310 | -0.429 |
| 125 | 9.488 | 33.249 | 224.5 | 90.9 | 3.940 | 25.672 | -0.337 |
| 150 | 9.345 | 33.636 | 185.5 | 90.9 | 4.493 | 25.997 | -0.053 |
| 200 | 8.647 | 33.941 | 125.7 | 91.0 | 5.401 | 26.347 | 0.076 |
| 250 | 7.926 | 34.033 | 101.7 | 91.1 | 6.208 | 26.529 | 0.039 |
| 300 | 7.257 | 34.058 | 82.9 | 91.1 | 6.949 | 26.645 | -0.038 |
| 400 | 6.312 | 34.107 | 51.7 | 91.2 | 8.307 | 26.812 | -0.128 |
| 500 | 5.599 | 34.182 | 29.9 | 91.2 | 9.522 | 26.961 | -0.159 |
| 600 | 4.948 | 34.235 | 17.6 | 91.2 | 10.615 | 27.080 | -0.193 |
| 700 | 4.655 | 34.323 | 12.3 | 91.2 | 11.604 | 27.184 | -0.157 |
| 800 | 4.367 | 34.374 | 12.8 | 91.2 | 12.521 | 27.256 | -0.149 |
| 900 | 4.038 | 34.416 | 16.1 | 91.3 | 13.379 | 27.324 | -0.151 |
| 1000 | 3.836 | 34.461 | 22.6 | 91.3 | 14.180 | 27.382 | -0.136 |
| 1028 | 3.762 | 34.470 | 24.5 | 91.3 | 14.396 | 27.397 | -0.136 |

Station: 14 Date: 11/07/2007, 2112 Lat.: 35° 47.65 N Long.: 124° 12.03 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.963 | 32.898 | 268.5 | 86.7 | 0.036 | 24.360 | 0.456 |
| 10 | 15.205 | 33.044 | 268.5 | 87.0 | 0.355 | 24.420 | 0.626 |
| 20 | 15.141 | 33.122 | 268.9 | 87.7 | 0.702 | 24.494 | 0.673 |
| 30 | 14.949 | 33.115 | 267.5 | 88.3 | 1.044 | 24.531 | 0.624 |
| 50 | 11.806 | 32.808 | 275.5 | 89.9 | 1.690 | 24.924 | -0.274 |
| 75 | 10.885 | 32.830 | 260.4 | 90.5 | 2.425 | 25.108 | -0.429 |
| 100 | 10.712 | 33.101 | 240.0 | 90.8 | 3.112 | 25.350 | -0.243 |
| 125 | 9.651 | 33.437 | 206.0 | 91.0 | 3.721 | 25.792 | -0.160 |
| 150 | 9.613 | 33.838 | 129.4 | 90.9 | 4.235 | 26.112 | 0.152 |
| 200 | 8.759 | 34.023 | 94.8 | 91.0 | 5.119 | 26.394 | 0.159 |
| 250 | 8.171 | 34.089 | 78.1 | 91.1 | 5.911 | 26.537 | 0.120 |
| 300 | 7.661 | 34.133 | 64.2 | 91.2 | 6.654 | 26.647 | 0.078 |
| 400 | 6.803 | 34.191 | 39.8 | 91.2 | 8.015 | 26.813 | 0.003 |
| 500 | 5.944 | 34.233 | 24.4 | 91.2 | 9.235 | 26.959 | -0.076 |
| 600 | 5.574 | 34.306 | 15.4 | 91.2 | 10.345 | 27.063 | -0.064 |
| 700 | 4.865 | 34.319 | 13.2 | 91.2 | 11.366 | 27.157 | -0.137 |
| 800 | 4.626 | 34.391 | 14.0 | 91.2 | 12.305 | 27.242 | -0.108 |
| 900 | 4.196 | 34.416 | 16.5 | 91.2 | 13.178 | 27.309 | -0.134 |
| 1000 | 3.899 | 34.453 | 21.5 | 91.3 | 13.993 | 27.369 | -0.136 |
| 1018 | 3.830 | 34.458 | 22.6 | 91.3 | 14.134 | 27.380 | -0.139 |

Station: 15 Date: 11/07/2007, 2348 Lat.: 35° 42.53 N Long.: 124° 22.70 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.649 | 33.008 | 263.1 | 87.6 | 0.036 | 24.295 | 0.699 |
| 10 | 15.618 | 33.008 | 264.0 | 87.5 | 0.362 | 24.302 | 0.691 |
| 20 | 15.429 | 33.164 | 265.8 | 86.7 | 0.716 | 24.464 | 0.771 |
| 30 | 15.392 | 33.163 | 264.8 | 87.4 | 1.062 | 24.471 | 0.762 |
| 50 | 14.989 | 33.115 | 264.0 | 89.2 | 1.752 | 24.523 | 0.632 |
| 75 | 13.234 | 33.252 | 263.8 | 90.2 | 2.530 | 24.994 | 0.364 |
| 100 | 11.211 | 33.335 | 221.7 | 90.4 | 3.223 | 25.444 | 0.035 |
| 125 | 10.486 | 33.645 | 168.8 | 90.6 | 3.805 | 25.814 | 0.150 |
| 150 | 9.383 | 33.715 | 158.0 | 91.0 | 4.323 | 26.053 | 0.016 |
| 200 | 8.492 | 33.961 | 129.6 | 91.0 | 5.216 | 26.387 | 0.069 |
| 250 | 7.866 | 34.026 | 103.9 | 91.1 | 6.014 | 26.532 | 0.025 |
| 300 | 7.549 | 34.116 | 69.7 | 91.2 | 6.756 | 26.649 | 0.049 |
| 400 | 6.646 | 34.157 | 43.6 | 91.2 | 8.111 | 26.807 | -0.045 |
| 500 | 6.045 | 34.238 | 24.1 | 91.2 | 9.337 | 26.951 | -0.059 |
| 600 | 5.543 | 34.309 | 15.2 | 91.2 | 10.440 | 27.069 | -0.066 |
| 700 | 5.029 | 34.334 | 13.3 | 91.2 | 11.461 | 27.151 | -0.107 |
| 800 | 4.694 | 34.371 | 13.4 | 91.3 | 12.414 | 27.218 | -0.116 |
| 900 | 4.136 | 34.455 | 20.5 | 91.2 | 13.287 | 27.346 | -0.110 |
| 1000 | 3.881 | 34.468 | 23.3 | 91.2 | 14.079 | 27.383 | -0.126 |
| 1019 | 3.844 | 34.473 | 24.6 | 91.2 | 14.226 | 27.391 | -0.126 |

Station: 16 Date: 11/08/2007, 0200 Lat.: 35° 37.60 N Long.: 124° 33.33 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.372 | 32.064 | 166.7 | 87.1 | 0.043 | 23.629 | -0.119 |
| 10 | 15.376 | 32.855 | 263.8 | 87.4 | 0.391 | 24.237 | 0.515 |
| 20 | 15.118 | 32.874 | 269.1 | 86.8 | 0.756 | 24.308 | 0.471 |
| 30 | 14.858 | 32.870 | 271.2 | 87.8 | 1.114 | 24.361 | 0.409 |
| 50 | 11.858 | 32.696 | 287.3 | 89.5 | 1.789 | 24.828 | -0.354 |
| 75 | 10.706 | 32.850 | 265.7 | 90.7 | 2.523 | 25.155 | -0.445 |
| 100 | 11.133 | 33.466 | 206.9 | 90.9 | 3.185 | 25.560 | 0.124 |
| 125 | 9.426 | 33.593 | 177.5 | 91.0 | 3.740 | 25.951 | -0.073 |
| 150 | 8.729 | 33.799 | 156.2 | 91.0 | 4.220 | 26.223 | -0.022 |
| 200 | 8.277 | 33.972 | 138.7 | 91.1 | 5.067 | 26.428 | 0.045 |
| 250 | 7.661 | 34.023 | 101.9 | 91.2 | 5.850 | 26.559 | -0.008 |
| 300 | 7.221 | 34.066 | 76.8 | 91.2 | 6.583 | 26.657 | -0.036 |
| 400 | 6.294 | 34.113 | 50.0 | 91.2 | 7.931 | 26.819 | -0.125 |
| 500 | 5.355 | 34.151 | 34.0 | 91.3 | 9.138 | 26.965 | -0.212 |
| 600 | 5.040 | 34.255 | 17.1 | 91.3 | 10.229 | 27.085 | -0.167 |
| 700 | 4.685 | 34.319 | 12.7 | 91.3 | 11.225 | 27.177 | -0.157 |
| 800 | 4.355 | 34.373 | 12.8 | 91.2 | 12.145 | 27.257 | -0.151 |
| 900 | 4.226 | 34.443 | 18.9 | 91.1 | 13.004 | 27.327 | -0.110 |
| 1000 | 3.824 | 34.460 | 22.1 | 91.2 | 13.806 | 27.382 | -0.138 |
| 1028 | 3.749 | 34.467 | 23.6 | 91.3 | 14.023 | 27.395 | -0.140 |

Station: 17 Date: 11/08/2007, 0443 Lat.: 35° 32.55 N Long.: 124° 43.99 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.172 | 32.885 | 268.3 | 87.2 | 0.036 | 24.304 | 0.492 |
| 10 | 15.182 | 32.886 | 269.7 | 87.1 | 0.361 | 24.304 | 0.496 |
| 20 | 15.143 | 32.885 | 269.4 | 87.3 | 0.722 | 24.311 | 0.485 |
| 30 | 14.233 | 32.812 | 275.7 | 88.2 | 1.080 | 24.449 | 0.226 |
| 50 | 12.561 | 33.012 | 260.2 | 90.2 | 1.726 | 24.940 | 0.038 |
| 75 | 10.910 | 33.099 | 243.2 | 90.8 | 2.427 | 25.313 | -0.208 |
| 100 | 10.247 | 33.459 | 198.7 | 90.9 | 3.034 | 25.709 | -0.040 |
| 125 | 9.328 | 33.676 | 161.7 | 91.0 | 3.569 | 26.031 | -0.024 |
| 150 | 9.011 | 33.791 | 147.5 | 91.0 | 4.048 | 26.172 | 0.016 |
| 200 | 8.175 | 33.976 | 137.1 | 91.1 | 4.897 | 26.447 | 0.032 |
| 250 | 7.586 | 34.027 | 102.7 | 91.1 | 5.670 | 26.574 | -0.015 |
| 300 | 7.099 | 34.058 | 79.1 | 91.1 | 6.396 | 26.667 | -0.060 |
| 400 | 6.245 | 34.124 | 46.7 | 91.2 | 7.725 | 26.834 | -0.123 |
| 500 | 5.581 | 34.172 | 30.5 | 91.3 | 8.935 | 26.955 | -0.169 |
| 600 | 4.856 | 34.211 | 21.6 | 91.3 | 10.033 | 27.071 | -0.223 |
| 700 | 4.688 | 34.314 | 12.7 | 91.2 | 11.033 | 27.173 | -0.161 |
| 800 | 4.336 | 34.365 | 12.4 | 91.3 | 11.958 | 27.252 | -0.160 |
| 900 | 4.084 | 34.416 | 15.5 | 91.3 | 12.818 | 27.320 | -0.146 |
| 1000 | 3.776 | 34.454 | 20.9 | 91.3 | 13.621 | 27.382 | -0.148 |
| 1027 | 3.694 | 34.460 | 22.3 | 91.3 | 13.828 | 27.395 | -0.151 |

Station: 18 Date: 11/08/2007, 0700 Lat.: 35° 27.53 N Long.: 124° 54.40 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.656 | 33.039 | 263.7 | 87.7 | 0.036 | 24.317 | 0.725 |
| 10 | 15.662 | 33.037 | 264.3 | 87.7 | 0.360 | 24.314 | 0.724 |
| 20 | 15.669 | 33.037 | 263.6 | 87.7 | 0.721 | 24.313 | 0.726 |
| 30 | 15.648 | 33.148 | 264.5 | 87.6 | 1.080 | 24.403 | 0.808 |
| 50 | 14.260 | 33.169 | 260.5 | 89.8 | 1.761 | 24.720 | 0.515 |
| 75 | 10.464 | 32.960 | 254.1 | 90.8 | 2.489 | 25.282 | -0.400 |
| 100 | 10.863 | 33.358 | 219.4 | 90.8 | 3.139 | 25.523 | -0.011 |
| 125 | 9.795 | 33.546 | 192.5 | 91.0 | 3.718 | 25.853 | -0.049 |
| 150 | 9.127 | 33.775 | 149.5 | 91.0 | 4.226 | 26.141 | 0.022 |
| 200 | 8.518 | 33.954 | 145.9 | 91.1 | 5.109 | 26.378 | 0.067 |
| 250 | 7.856 | 34.029 | 109.2 | 91.1 | 5.908 | 26.536 | 0.026 |
| 300 | 7.236 | 34.069 | 78.4 | 91.2 | 6.642 | 26.656 | -0.033 |
| 400 | 6.111 | 34.070 | 61.8 | 91.2 | 7.994 | 26.808 | -0.182 |
| 500 | 5.372 | 34.116 | 42.6 | 91.3 | 9.220 | 26.936 | -0.238 |
| 600 | 4.877 | 34.211 | 21.4 | 91.3 | 10.330 | 27.069 | -0.220 |
| 700 | 4.602 | 34.316 | 12.7 | 91.3 | 11.329 | 27.184 | -0.168 |
| 800 | 4.283 | 34.366 | 12.4 | 91.3 | 12.243 | 27.259 | -0.164 |
| 900 | 4.039 | 34.416 | 15.7 | 91.3 | 13.098 | 27.324 | -0.151 |
| 1000 | 3.786 | 34.454 | 20.8 | 91.3 | 13.900 | 27.381 | -0.147 |
| 1100 | 3.527 | 34.483 | 27.2 | 91.3 | 14.655 | 27.431 | -0.149 |
| 1200 | 3.341 | 34.506 | 33.4 | 91.3 | 15.372 | 27.467 | -0.149 |
| 1300 | 3.162 | 34.527 | 39.4 | 91.3 | 16.056 | 27.501 | -0.150 |
| 1400 | 2.989 | 34.546 | 45.2 | 91.3 | 16.714 | 27.533 | -0.151 |
| 1500 | 2.793 | 34.560 | 50.5 | 91.3 | 17.344 | 27.562 | -0.158 |
| 1750 | 2.412 | 34.583 | 61.6 | 91.4 | 18.819 | 27.614 | -0.173 |
| 2000 | 2.121 | 34.612 | 76.6 | 91.4 | 20.177 | 27.662 | -0.175 |
| 2021 | 2.103 | 34.613 | 77.8 | 91.4 | 20.287 | 27.665 | -0.175 |

Station: 19 Date: 11/08/2007, 0926 Lat.: 35° 27.07 N Long.: 124° 53.90 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|-------|----------------|----------------|
| 0 | 15.657 | 33.038 | 262.0 | 87.5 | 0.036 | 24.316 | 0.724 |
| 10 | 15.657 | 33.039 | 262.8 | 87.9 | 0.360 | 24.317 | 0.725 |
| 20 | 15.637 | 33.037 | 263.9 | 87.9 | 0.720 | 24.320 | 0.718 |
| 30 | 15.477 | 33.107 | 266.0 | 88.0 | 1.076 | 24.409 | 0.736 |
| 50 | 13.868 | 33.151 | 260.7 | 90.0 | 1.755 | 24.787 | 0.417 |
| 75 | 10.557 | 32.941 | 255.9 | 90.8 | 2.479 | 25.251 | -0.399 |
| 100 | 10.692 | 33.346 | 216.7 | 90.8 | 3.127 | 25.544 | -0.051 |
| 125 | 9.850 | 33.551 | 190.3 | 91.0 | 3.702 | 25.848 | -0.036 |
| 150 | 9.147 | 33.787 | 150.2 | 91.0 | 4.210 | 26.147 | 0.035 |
| 200 | 8.518 | 33.954 | 146.1 | 91.1 | 5.097 | 26.378 | 0.067 |
| 204 | 8.433 | 33.962 | 146.1 | 91.1 | 5.163 | 26.397 | 0.060 |

Station: 20 Date: 11/08/2007, 1220 Lat.: 35° 45.00 N Long.: 125° 07.39 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.277 | 32.689 | 264.5 | 89.4 | 0.038 | 24.131 | 0.360 |
| 10 | 15.276 | 32.688 | 265.2 | 89.5 | 0.378 | 24.131 | 0.359 |
| 20 | 15.263 | 32.688 | 265.1 | 89.5 | 0.756 | 24.133 | 0.356 |
| 30 | 15.171 | 32.682 | 266.1 | 89.4 | 1.133 | 24.149 | 0.330 |
| 50 | 14.826 | 32.716 | 268.6 | 89.7 | 1.879 | 24.250 | 0.279 |
| 75 | 11.707 | 32.881 | 277.9 | 90.5 | 2.683 | 25.000 | -0.235 |
| 100 | 10.468 | 32.814 | 270.2 | 90.9 | 3.404 | 25.168 | -0.517 |
| 125 | 10.117 | 33.166 | 232.7 | 91.0 | 4.067 | 25.503 | -0.297 |
| 150 | 9.278 | 33.589 | 183.8 | 91.0 | 4.640 | 25.972 | -0.101 |
| 200 | 8.396 | 33.902 | 180.2 | 91.1 | 5.568 | 26.356 | 0.007 |
| 250 | 7.465 | 33.945 | 151.1 | 91.1 | 6.373 | 26.526 | -0.097 |
| 300 | 7.025 | 34.018 | 98.7 | 91.2 | 7.114 | 26.646 | -0.102 |
| 400 | 6.102 | 34.058 | 62.5 | 91.2 | 8.479 | 26.799 | -0.193 |
| 500 | 5.330 | 34.121 | 38.3 | 91.3 | 9.708 | 26.945 | -0.239 |
| 600 | 4.974 | 34.225 | 19.2 | 91.3 | 10.816 | 27.069 | -0.198 |
| 700 | 4.466 | 34.275 | 13.3 | 91.3 | 11.819 | 27.166 | -0.216 |
| 800 | 4.384 | 34.364 | 12.2 | 91.3 | 12.747 | 27.246 | -0.155 |
| 900 | 4.041 | 34.419 | 15.9 | 91.3 | 13.607 | 27.327 | -0.148 |
| 1000 | 3.795 | 34.456 | 20.9 | 91.3 | 14.409 | 27.382 | -0.144 |
| 1028 | 3.712 | 34.464 | 22.5 | 91.3 | 14.624 | 27.397 | -0.146 |

Station: 21 Date: 11/08/2007, 1546 Lat.: 36° 02.27 N Long.: 125° 20.36 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.977 | 32.703 | 265.6 | 89.4 | 0.037 | 24.207 | 0.304 |
| 10 | 14.983 | 32.704 | 266.5 | 89.5 | 0.370 | 24.206 | 0.306 |
| 20 | 14.837 | 32.686 | 268.7 | 89.4 | 0.741 | 24.224 | 0.259 |
| 30 | 14.800 | 32.682 | 269.4 | 89.4 | 1.110 | 24.229 | 0.247 |
| 50 | 14.309 | 32.709 | 271.8 | 89.4 | 1.840 | 24.355 | 0.160 |
| 75 | 12.424 | 32.866 | 286.3 | 90.0 | 2.673 | 24.854 | -0.108 |
| 100 | 11.585 | 32.924 | 271.2 | 90.8 | 3.422 | 25.056 | -0.224 |
| 125 | 11.050 | 33.052 | 264.8 | 91.1 | 4.132 | 25.253 | -0.222 |
| 150 | 10.022 | 33.402 | 235.4 | 91.1 | 4.765 | 25.704 | -0.125 |
| 200 | 8.479 | 33.871 | 163.1 | 91.1 | 5.759 | 26.318 | -0.005 |
| 250 | 7.647 | 33.949 | 163.3 | 91.1 | 6.577 | 26.503 | -0.068 |
| 300 | 7.036 | 33.994 | 113.2 | 91.1 | 7.331 | 26.625 | -0.119 |
| 400 | 5.835 | 34.023 | 69.1 | 91.2 | 8.693 | 26.805 | -0.255 |
| 500 | 5.205 | 34.113 | 39.4 | 91.3 | 9.909 | 26.953 | -0.259 |
| 600 | 4.744 | 34.185 | 22.9 | 91.3 | 11.010 | 27.063 | -0.256 |
| 700 | 4.465 | 34.276 | 13.4 | 91.3 | 12.018 | 27.167 | -0.214 |
| 800 | 4.220 | 34.347 | 11.5 | 91.3 | 12.943 | 27.250 | -0.185 |
| 900 | 3.890 | 34.393 | 13.1 | 91.3 | 13.798 | 27.322 | -0.183 |
| 1000 | 3.586 | 34.434 | 16.6 | 91.3 | 14.595 | 27.385 | -0.182 |
| 1020 | 3.503 | 34.438 | 17.2 | 91.3 | 14.748 | 27.396 | -0.187 |

Station: 22 Date: 11/08/2007, 1916 Lat.: 36° 19.50 N Long.: 125° 33.26 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 15.001 | 32.737 | 265.6 | 89.3 | 0.037 | 24.228 | 0.337 |
| 10 | 15.011 | 32.738 | 266.5 | 89.4 | 0.369 | 24.227 | 0.340 |
| 20 | 14.217 | 32.703 | 273.1 | 89.4 | 0.729 | 24.368 | 0.136 |
| 30 | 13.630 | 32.734 | 277.8 | 89.8 | 1.080 | 24.513 | 0.035 |
| 50 | 11.201 | 32.663 | 283.9 | 90.1 | 1.720 | 24.922 | -0.504 |
| 75 | 10.053 | 32.707 | 271.5 | 90.8 | 2.446 | 25.154 | -0.675 |
| 100 | 9.682 | 32.901 | 253.7 | 91.0 | 3.126 | 25.368 | -0.583 |
| 125 | 9.406 | 33.272 | 217.4 | 91.1 | 3.745 | 25.703 | -0.332 |
| 150 | 8.923 | 33.583 | 200.2 | 91.1 | 4.280 | 26.023 | -0.163 |
| 200 | 8.332 | 33.901 | 134.0 | 91.0 | 5.183 | 26.364 | -0.003 |
| 250 | 7.569 | 34.014 | 89.8 | 91.1 | 5.975 | 26.565 | -0.028 |
| 300 | 6.622 | 34.003 | 98.6 | 91.1 | 6.694 | 26.688 | -0.168 |
| 400 | 5.820 | 34.068 | 54.8 | 91.2 | 8.013 | 26.843 | -0.220 |
| 500 | 5.142 | 34.141 | 32.6 | 91.3 | 9.195 | 26.983 | -0.244 |
| 600 | 4.685 | 34.208 | 19.2 | 91.3 | 10.272 | 27.088 | -0.243 |
| 700 | 4.449 | 34.288 | 12.6 | 91.3 | 11.261 | 27.178 | -0.207 |
| 800 | 4.123 | 34.361 | 11.7 | 91.3 | 12.170 | 27.271 | -0.184 |
| 900 | 3.869 | 34.415 | 14.6 | 91.3 | 13.005 | 27.341 | -0.168 |
| 1000 | 3.557 | 34.456 | 19.8 | 91.3 | 13.783 | 27.405 | -0.167 |
| 1030 | 3.418 | 34.455 | 19.6 | 91.3 | 14.006 | 27.418 | -0.181 |

Station: 23 Date: 11/08/2007, 2228 Lat.: 36° 36.89 N Long.: 125° 46.21 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.075 | 32.722 | 274.7 | 87.6 | 0.035 | 24.412 | 0.121 |
| 10 | 13.957 | 32.720 | 276.0 | 87.4 | 0.350 | 24.434 | 0.094 |
| 20 | 13.888 | 32.809 | 275.5 | 87.5 | 0.695 | 24.518 | 0.150 |
| 30 | 13.988 | 32.887 | 273.6 | 87.8 | 1.034 | 24.558 | 0.233 |
| 50 | 12.130 | 32.719 | 277.7 | 89.7 | 1.699 | 24.795 | -0.282 |
| 75 | 9.816 | 33.156 | 229.6 | 90.8 | 2.378 | 25.544 | -0.355 |
| 100 | 9.190 | 33.519 | 192.1 | 91.0 | 2.937 | 25.930 | -0.171 |
| 125 | 8.796 | 33.785 | 156.7 | 90.9 | 3.423 | 26.201 | -0.022 |
| 150 | 8.328 | 33.876 | 146.2 | 91.0 | 3.860 | 26.345 | -0.023 |
| 200 | 7.711 | 33.971 | 127.5 | 91.1 | 4.667 | 26.511 | -0.041 |
| 250 | 7.170 | 33.997 | 110.7 | 91.1 | 5.416 | 26.609 | -0.098 |
| 300 | 6.701 | 34.037 | 75.6 | 91.2 | 6.124 | 26.704 | -0.131 |
| 400 | 5.447 | 34.031 | 63.3 | 91.2 | 7.424 | 26.858 | -0.295 |
| 500 | 5.116 | 34.145 | 31.8 | 91.3 | 8.597 | 26.989 | -0.244 |
| 600 | 4.713 | 34.216 | 18.9 | 91.3 | 9.669 | 27.091 | -0.235 |
| 700 | 4.415 | 34.286 | 13.0 | 91.3 | 10.655 | 27.180 | -0.212 |
| 800 | 4.104 | 34.346 | 11.4 | 91.3 | 11.565 | 27.261 | -0.198 |
| 900 | 3.827 | 34.397 | 13.2 | 91.4 | 12.410 | 27.331 | -0.186 |
| 1000 | 3.586 | 34.449 | 18.6 | 91.4 | 13.195 | 27.397 | -0.170 |
| 1100 | 3.345 | 34.475 | 23.3 | 91.4 | 13.932 | 27.441 | -0.173 |
| 1200 | 3.094 | 34.503 | 29.9 | 91.4 | 14.628 | 27.488 | -0.174 |
| 1300 | 2.939 | 34.524 | 36.4 | 91.4 | 15.290 | 27.518 | -0.172 |
| 1400 | 2.764 | 34.537 | 40.4 | 91.4 | 15.927 | 27.545 | -0.178 |
| 1500 | 2.592 | 34.551 | 45.1 | 91.4 | 16.540 | 27.571 | -0.182 |
| 1750 | 2.206 | 34.587 | 61.3 | 91.5 | 17.962 | 27.634 | -0.186 |
| 2000 | 1.976 | 34.615 | 77.5 | 91.5 | 19.262 | 27.676 | -0.183 |
| 2022 | 1.958 | 34.617 | 78.9 | 91.5 | 19.373 | 27.678 | -0.183 |

Station: 24 Date: 11/09/2007, 0238 Lat.: 36° 46.87 N Long.: 125° 24.69 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.828 | 32.873 | 267.7 | 87.2 | 0.035 | 24.370 | 0.406 |
| 10 | 14.833 | 32.873 | 270.0 | 87.4 | 0.355 | 24.369 | 0.407 |
| 20 | 14.664 | 32.873 | 271.1 | 87.3 | 0.708 | 24.405 | 0.369 |
| 30 | 14.139 | 32.851 | 272.3 | 88.7 | 1.055 | 24.499 | 0.237 |
| 50 | 10.523 | 33.048 | 246.0 | 89.9 | 1.669 | 25.341 | -0.318 |
| 75 | 9.927 | 33.377 | 206.4 | 90.4 | 2.284 | 25.699 | -0.160 |
| 100 | 8.964 | 33.723 | 166.1 | 90.8 | 2.800 | 26.126 | -0.044 |
| 125 | 8.461 | 33.858 | 131.6 | 90.8 | 3.251 | 26.310 | -0.017 |
| 150 | 8.172 | 33.939 | 114.3 | 90.8 | 3.669 | 26.417 | 0.003 |
| 200 | 7.343 | 33.965 | 123.5 | 90.9 | 4.447 | 26.558 | -0.098 |
| 250 | 6.885 | 34.007 | 90.4 | 91.0 | 5.173 | 26.656 | -0.129 |
| 300 | 6.513 | 34.030 | 75.5 | 91.1 | 5.868 | 26.723 | -0.161 |
| 400 | 5.758 | 34.092 | 46.8 | 91.1 | 7.149 | 26.869 | -0.209 |
| 500 | 5.032 | 34.146 | 30.2 | 91.2 | 8.311 | 26.999 | -0.253 |
| 600 | 4.657 | 34.232 | 16.9 | 91.2 | 9.371 | 27.110 | -0.228 |
| 700 | 4.274 | 34.313 | 11.9 | 91.2 | 10.329 | 27.217 | -0.205 |
| 800 | 3.971 | 34.370 | 11.9 | 91.2 | 11.204 | 27.294 | -0.193 |
| 900 | 3.766 | 34.425 | 15.4 | 91.2 | 12.022 | 27.359 | -0.170 |
| 1000 | 3.515 | 34.462 | 20.7 | 91.2 | 12.787 | 27.414 | -0.167 |
| 1024 | 3.461 | 34.473 | 23.9 | 91.3 | 12.962 | 27.428 | -0.163 |

Station: 25 Date: 11/09/2007, 0628 Lat.: 36° 56.91 N Long.: 125° 03.38 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 14.927 | 32.915 | 266.3 | 87.3 | 0.035 | 24.381 | 0.462 |
| 10 | 14.931 | 32.916 | 267.7 | 87.8 | 0.354 | 24.381 | 0.463 |
| 20 | 14.871 | 32.911 | 268.0 | 87.9 | 0.708 | 24.390 | 0.445 |
| 30 | 14.455 | 32.889 | 269.3 | 89.0 | 1.058 | 24.462 | 0.335 |
| 50 | 10.416 | 33.131 | 236.5 | 90.2 | 1.642 | 25.423 | -0.271 |
| 75 | 9.574 | 33.569 | 183.2 | 90.7 | 2.221 | 25.907 | -0.067 |
| 100 | 8.902 | 33.754 | 164.2 | 90.8 | 2.714 | 26.159 | -0.030 |
| 125 | 8.557 | 33.868 | 138.2 | 90.8 | 3.165 | 26.303 | 0.006 |
| 150 | 8.201 | 33.911 | 156.4 | 90.9 | 3.588 | 26.391 | -0.014 |
| 200 | 7.570 | 33.975 | 131.1 | 90.9 | 4.381 | 26.534 | -0.058 |
| 250 | 6.872 | 33.985 | 107.1 | 90.9 | 5.120 | 26.640 | -0.148 |
| 300 | 6.596 | 34.056 | 63.4 | 91.1 | 5.812 | 26.733 | -0.130 |
| 400 | 5.660 | 34.096 | 44.9 | 91.1 | 7.089 | 26.885 | -0.218 |
| 500 | 4.982 | 34.166 | 26.6 | 91.2 | 8.231 | 27.021 | -0.243 |
| 600 | 4.555 | 34.236 | 16.0 | 91.2 | 9.264 | 27.125 | -0.236 |
| 700 | 4.394 | 34.330 | 11.6 | 91.2 | 10.213 | 27.217 | -0.180 |
| 800 | 4.019 | 34.373 | 11.9 | 91.2 | 11.093 | 27.292 | -0.185 |
| 900 | 3.835 | 34.417 | 14.9 | 91.2 | 11.918 | 27.346 | -0.170 |
| 1000 | 3.590 | 34.450 | 18.9 | 91.2 | 12.697 | 27.397 | -0.169 |
| 1025 | 3.545 | 34.456 | 19.9 | 91.3 | 12.885 | 27.406 | -0.168 |

Station: 26 Date: 11/09/2007, 1018 Lat.: 37° 06.79 N Long.: 124° 41.55 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 13.260 | 32.774 | 280.5 | 86.2 | 0.033 | 24.618 | -0.009 |
| 10 | 13.040 | 32.813 | 282.0 | 86.6 | 0.329 | 24.691 | -0.024 |
| 20 | 13.231 | 32.965 | 279.6 | 87.3 | 0.651 | 24.772 | 0.137 |
| 30 | 11.841 | 32.822 | 275.8 | 88.6 | 0.960 | 24.928 | -0.255 |
| 50 | 9.733 | 32.840 | 254.4 | 90.3 | 1.512 | 25.311 | -0.623 |
| 75 | 9.148 | 33.429 | 213.4 | 90.8 | 2.104 | 25.866 | -0.248 |
| 100 | 8.997 | 33.752 | 165.1 | 90.9 | 2.601 | 26.143 | -0.016 |
| 125 | 8.835 | 33.916 | 115.1 | 90.9 | 3.050 | 26.298 | 0.088 |
| 150 | 8.583 | 33.999 | 99.3 | 90.9 | 3.471 | 26.402 | 0.114 |
| 200 | 8.012 | 34.068 | 78.7 | 90.9 | 4.262 | 26.543 | 0.080 |
| 250 | 7.506 | 34.091 | 67.4 | 91.1 | 4.997 | 26.635 | 0.024 |
| 300 | 6.703 | 34.072 | 63.5 | 91.2 | 5.691 | 26.731 | -0.103 |
| 400 | 5.880 | 34.107 | 45.2 | 91.2 | 6.977 | 26.866 | -0.182 |
| 500 | 5.619 | 34.224 | 23.9 | 91.3 | 8.146 | 26.992 | -0.122 |
| 600 | 5.257 | 34.315 | 14.2 | 91.2 | 9.216 | 27.108 | -0.095 |
| 700 | 4.875 | 34.364 | 13.0 | 91.2 | 10.199 | 27.192 | -0.100 |
| 800 | 4.431 | 34.400 | 14.6 | 91.3 | 11.109 | 27.270 | -0.121 |
| 900 | 4.109 | 34.433 | 17.9 | 91.3 | 11.958 | 27.331 | -0.130 |
| 1000 | 3.839 | 34.468 | 23.6 | 91.3 | 12.756 | 27.387 | -0.131 |
| 1016 | 3.797 | 34.472 | 24.6 | 91.3 | 12.879 | 27.394 | -0.132 |

Station: 27 Date: 11/09/2007, 1402 Lat.: 37° 16.89 N Long.: 124° 19.85 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 13.589 | 33.186 | 273.9 | 88.8 | 0.031 | 24.870 | 0.387 |
| 10 | 13.588 | 33.185 | 274.5 | 88.8 | 0.307 | 24.870 | 0.386 |
| 20 | 13.526 | 33.180 | 275.3 | 89.0 | 0.615 | 24.879 | 0.369 |
| 30 | 12.635 | 33.322 | 250.5 | 90.0 | 0.911 | 25.166 | 0.300 |
| 50 | 10.914 | 33.575 | 181.6 | 90.3 | 1.414 | 25.682 | 0.172 |
| 75 | 10.148 | 33.757 | 135.7 | 90.1 | 1.955 | 25.958 | 0.180 |
| 100 | 9.653 | 33.835 | 125.1 | 90.4 | 2.452 | 26.102 | 0.157 |
| 125 | 9.002 | 33.876 | 124.8 | 90.9 | 2.915 | 26.240 | 0.083 |
| 150 | 8.758 | 33.962 | 108.3 | 90.9 | 3.351 | 26.346 | 0.112 |
| 200 | 8.156 | 34.042 | 94.5 | 91.1 | 4.165 | 26.501 | 0.081 |
| 250 | 7.668 | 34.081 | 75.9 | 91.2 | 4.918 | 26.604 | 0.040 |
| 300 | 7.115 | 34.095 | 68.5 | 91.2 | 5.630 | 26.694 | -0.028 |
| 400 | 6.476 | 34.174 | 38.6 | 91.2 | 6.944 | 26.843 | -0.053 |
| 500 | 5.566 | 34.196 | 26.7 | 91.2 | 8.137 | 26.976 | -0.151 |
| 600 | 5.141 | 34.273 | 16.1 | 91.2 | 9.224 | 27.088 | -0.142 |
| 700 | 4.696 | 34.332 | 12.2 | 91.2 | 10.214 | 27.187 | -0.145 |
| 800 | 4.415 | 34.380 | 12.9 | 91.3 | 11.133 | 27.256 | -0.139 |
| 900 | 4.055 | 34.410 | 15.0 | 91.3 | 11.992 | 27.318 | -0.154 |
| 1000 | 3.770 | 34.447 | 18.9 | 91.3 | 12.799 | 27.377 | -0.154 |
| 1028 | 3.687 | 34.457 | 20.7 | 91.3 | 13.015 | 27.393 | -0.154 |

Station: 28 Date: 11/09/2007, 1753 Lat.: 37° 26.62 N Long.: 123° 58.15 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 13.850 | 33.195 | 273.8 | 88.5 | 0.031 | 24.823 | 0.450 |
| 10 | 13.757 | 33.196 | 274.2 | 88.6 | 0.311 | 24.844 | 0.431 |
| 20 | 13.523 | 33.261 | 275.8 | 89.5 | 0.614 | 24.942 | 0.432 |
| 30 | 12.215 | 33.307 | 238.6 | 90.0 | 0.904 | 25.235 | 0.205 |
| 50 | 10.565 | 33.475 | 197.0 | 90.2 | 1.395 | 25.665 | 0.030 |
| 75 | 9.954 | 33.776 | 135.3 | 90.5 | 1.924 | 26.005 | 0.162 |
| 100 | 9.420 | 33.886 | 112.5 | 90.6 | 2.403 | 26.180 | 0.159 |
| 125 | 9.160 | 33.969 | 93.8 | 90.6 | 2.852 | 26.287 | 0.181 |
| 150 | 8.867 | 34.027 | 85.5 | 90.8 | 3.279 | 26.380 | 0.180 |
| 200 | 8.447 | 34.090 | 72.1 | 90.8 | 4.087 | 26.495 | 0.163 |
| 250 | 8.028 | 34.144 | 61.2 | 91.0 | 4.847 | 26.601 | 0.142 |
| 300 | 7.503 | 34.163 | 53.2 | 91.1 | 5.562 | 26.693 | 0.080 |
| 400 | 6.323 | 34.154 | 40.9 | 91.2 | 6.883 | 26.847 | -0.089 |
| 500 | 5.700 | 34.203 | 26.5 | 91.2 | 8.082 | 26.966 | -0.129 |
| 600 | 5.165 | 34.255 | 16.6 | 91.3 | 9.179 | 27.071 | -0.153 |
| 700 | 4.766 | 34.322 | 12.3 | 91.3 | 10.187 | 27.170 | -0.146 |
| 800 | 4.480 | 34.378 | 13.2 | 91.1 | 11.117 | 27.247 | -0.134 |
| 900 | 4.219 | 34.412 | 15.1 | 91.2 | 11.993 | 27.303 | -0.135 |
| 1000 | 3.861 | 34.456 | 20.5 | 91.3 | 12.808 | 27.375 | -0.138 |
| 1026 | 3.780 | 34.463 | 21.9 | 91.3 | 13.010 | 27.389 | -0.140 |

Station: 29 Date: 11/09/2007, 2145 Lat.: 37° 36.81 N Long.: 123° 36.44 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 13.780 | 33.007 | 275.7 | 87.5 | 0.032 | 24.693 | 0.286 |
| 10 | 13.684 | 33.008 | 277.4 | 87.3 | 0.323 | 24.713 | 0.266 |
| 20 | 13.302 | 33.058 | 276.9 | 87.6 | 0.642 | 24.829 | 0.225 |
| 30 | 12.382 | 33.082 | 276.0 | 88.1 | 0.945 | 25.028 | 0.058 |
| 50 | 9.927 | 33.127 | 233.4 | 90.5 | 1.483 | 25.503 | -0.359 |
| 75 | 9.726 | 33.703 | 157.8 | 90.8 | 2.047 | 25.986 | 0.065 |
| 100 | 9.087 | 33.849 | 128.8 | 90.9 | 2.526 | 26.205 | 0.075 |
| 125 | 8.796 | 33.935 | 119.6 | 91.1 | 2.969 | 26.319 | 0.097 |
| 150 | 8.492 | 33.987 | 110.7 | 91.2 | 3.390 | 26.407 | 0.090 |
| 200 | 8.106 | 34.074 | 80.8 | 91.1 | 4.179 | 26.534 | 0.099 |
| 250 | 7.241 | 34.039 | 82.1 | 91.2 | 4.920 | 26.632 | -0.054 |
| 300 | 6.980 | 34.101 | 59.4 | 91.3 | 5.619 | 26.717 | -0.042 |
| 400 | 6.215 | 34.150 | 40.8 | 91.3 | 6.921 | 26.858 | -0.106 |
| 500 | 5.559 | 34.180 | 28.3 | 91.3 | 8.111 | 26.964 | -0.165 |
| 600 | 5.206 | 34.267 | 16.2 | 91.3 | 9.205 | 27.076 | -0.139 |
| 700 | 4.848 | 34.329 | 13.0 | 91.2 | 10.216 | 27.167 | -0.131 |
| 800 | 4.390 | 34.378 | 12.8 | 91.3 | 11.140 | 27.257 | -0.143 |
| 900 | 4.130 | 34.420 | 15.6 | 91.2 | 12.003 | 27.318 | -0.138 |
| 1000 | 3.813 | 34.451 | 19.4 | 91.3 | 12.808 | 27.376 | -0.146 |
| 1020 | 3.783 | 34.459 | 20.8 | 91.3 | 12.964 | 27.385 | -0.143 |

Station: 30 Date: 11/10/2007, 0019 Lat.: 37° 41.77 N Long.: 123° 25.60 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|--------|----------------|----------------|
| 0 | 13.523 | 32.794 | 156.8 | 87.8 | 0.033 | 24.580 | 0.061 |
| 10 | 13.241 | 33.154 | 275.6 | 87.3 | 0.317 | 24.916 | 0.290 |
| 20 | 12.154 | 33.219 | 272.1 | 89.3 | 0.607 | 25.178 | 0.123 |
| 30 | 11.141 | 33.490 | 204.2 | 90.2 | 0.866 | 25.575 | 0.147 |
| 50 | 10.608 | 33.569 | 180.0 | 90.6 | 1.332 | 25.731 | 0.112 |
| 75 | 9.938 | 33.666 | 163.1 | 90.9 | 1.874 | 25.922 | 0.072 |
| 100 | 9.300 | 33.789 | 140.3 | 91.0 | 2.371 | 26.123 | 0.062 |
| 125 | 9.110 | 33.907 | 118.3 | 91.0 | 2.831 | 26.247 | 0.125 |
| 150 | 8.861 | 33.993 | 103.8 | 91.1 | 3.265 | 26.354 | 0.152 |
| 200 | 8.479 | 34.053 | 88.1 | 91.1 | 4.085 | 26.461 | 0.139 |
| 250 | 8.032 | 34.127 | 62.5 | 90.7 | 4.854 | 26.588 | 0.130 |
| 300 | 7.416 | 34.165 | 51.4 | 91.1 | 5.566 | 26.707 | 0.069 |
| 400 | 6.506 | 34.165 | 40.2 | 91.0 | 6.886 | 26.833 | -0.056 |
| 500 | 5.519 | 34.159 | 31.8 | 91.3 | 8.104 | 26.953 | -0.186 |
| 600 | 5.099 | 34.282 | 15.8 | 91.2 | 9.202 | 27.100 | -0.139 |
| 700 | 4.787 | 34.337 | 13.1 | 91.2 | 10.190 | 27.180 | -0.132 |
| 800 | 4.408 | 34.389 | 14.0 | 91.1 | 11.110 | 27.263 | -0.133 |
| 900 | 4.040 | 34.429 | 16.9 | 91.1 | 11.955 | 27.335 | -0.140 |
| 1000 | 3.737 | 34.462 | 21.3 | 91.2 | 12.748 | 27.392 | -0.145 |
| 1016 | 3.665 | 34.469 | 23.1 | 91.1 | 12.869 | 27.405 | -0.146 |

Station: 31 Date: 11/10/2007, 0307 Lat.: 37° 46.90 N Long.: 123° 14.67 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|-------|----------------|----------------|
| 0 | 12.880 | 33.323 | 355.3 | 80.9 | 0.028 | 25.118 | 0.350 |
| 10 | 12.499 | 33.337 | 295.3 | 85.8 | 0.281 | 25.202 | 0.284 |
| 20 | 11.530 | 33.461 | 213.7 | 89.5 | 0.545 | 25.482 | 0.196 |
| 30 | 10.873 | 33.588 | 176.1 | 90.0 | 0.782 | 25.700 | 0.175 |
| 50 | 10.441 | 33.694 | 147.8 | 90.1 | 1.222 | 25.858 | 0.182 |
| 75 | 9.643 | 33.882 | 91.9 | 87.4 | 1.716 | 26.140 | 0.193 |
| 100 | 9.615 | 33.887 | 88.0 | 87.2 | 2.186 | 26.149 | 0.192 |
| 118 | 9.607 | 33.887 | 88.2 | 87.4 | 2.524 | 26.151 | 0.190 |

Station: 32 Date: 11/10/2007, 0506 Lat.: 37° 51.66 N Long.: 123° 04.45 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|-------|----------------|----------------|
| 0 | 12.719 | 33.312 | 323.5 | 87.9 | 0.028 | 25.141 | 0.309 |
| 10 | 12.602 | 33.315 | 297.5 | 87.8 | 0.281 | 25.166 | 0.288 |
| 20 | 12.214 | 33.357 | 260.7 | 89.6 | 0.556 | 25.273 | 0.244 |
| 30 | 11.522 | 33.434 | 222.9 | 90.0 | 0.814 | 25.462 | 0.172 |
| 50 | 10.234 | 33.670 | 151.9 | 90.3 | 1.276 | 25.875 | 0.127 |
| 75 | 9.817 | 33.809 | 110.3 | 89.2 | 1.783 | 26.054 | 0.164 |
| 84 | 9.732 | 33.824 | 109.2 | 89.0 | 1.958 | 26.080 | 0.162 |

Station: 33 Date: 11/10/2007, 0708 Lat.: 37° 56.80 N Long.: 122° 53.33 W

| P(dbar) | T(°C) | S | O ₂ (μmol/kg) | Xmiss(%) | ΔΦ | σ _θ | π _θ |
|---------|--------|--------|--------------------------|----------|-------|----------------|----------------|
| 0 | 13.136 | 33.222 | 406.1 | 82.4 | 0.030 | 24.989 | 0.322 |
| 10 | 12.878 | 33.211 | 361.4 | 80.5 | 0.295 | 25.032 | 0.261 |
| 20 | 11.947 | 33.348 | 243.5 | 87.9 | 0.579 | 25.317 | 0.186 |
| 30 | 10.572 | 33.658 | 145.8 | 89.9 | 0.812 | 25.807 | 0.177 |
| 44 | 10.233 | 33.751 | 103.4 | 80.0 | 1.104 | 25.938 | 0.191 |

Table A3: *Results of nutrient and primary productivity analyses of water samples collected at each hydrographic station during the PaCOOS cruise of November 2007. Stations are in chronological (and numerical) order. The time listed (<Mon. dd, yyyy hh:mm> UT) for each station is the beginning of the CTD cast. 12 Niskin bottles were tripped at each station, although some bottles sampled duplicate pressures. Except where primary productivity analyses were not performed (see Introduction), the data for each station are separated into two sections (“Physical and Chemical” and “Biological”).*

The physical oceanographic properties listed in the first seven columns of the “Physical and Chemical” section of each station’s data are the uncorrected values measured by the CTD at the times each Niskin bottle was tripped. Because they are uncorrected, these values may differ slightly from those listed in Table A2. The last four columns of this section give the nitrate (NO₃), nitrite (NO₂), phosphate (PO₄), and dissolved silicate (SiO₄) concentrations.

The “Biological” section of each station’s data gives the results of the primary productivity analyses. As stated above, primary productivity sampling was not undertaken at every hydrographic station.

| | | | | | | |
|-----------|--------------------|---------------------|---------------|----------|--------------|------|
| Date | Nov 06, 2007 12:13 | Cruise: S407 | Latitude: | 36.797 | Year: | 2007 |
| Project: | PACOOS | Station: C1 | Longitude: | -121.850 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 1 | Secchi Depth: | 3 | Day of Year: | 310 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.4 | 12 | 12.081 | 33.553 | 25.450 | 71 | 4.986 | 0.263 | 1.088 | 17.432 | 6.059 |
| 5 | 5.2 | 11 | 12.081 | 33.553 | 25.450 | 71 | 5.437 | 0.250 | 0.813 | 17.239 | 6.056 |
| 10 | 10.6 | 10 | 12.060 | 33.555 | 25.456 | 74 | 5.671 | 0.250 | 0.742 | 17.433 | 5.951 |
| 20 | 20.2 | 9 | 12.034 | 33.554 | 25.460 | 76 | 6.445 | 0.244 | 0.753 | 17.309 | 5.829 |
| 30 | 30.5 | 8 | 11.254 | 33.592 | 25.634 | 85 | 16.739 | 0.392 | 1.426 | 19.102 | 4.474 |
| 40 | 40.4 | 7 | 10.976 | 33.631 | 25.714 | 86 | 19.423 | 0.414 | 1.453 | 20.735 | 3.934 |
| 60 | 60.5 | 6 | 10.755 | 33.699 | 25.806 | 84 | --- | --- | --- | --- | 3.567 |
| 80 | 80.3 | 5 | 10.679 | 33.708 | 25.826 | 85 | 22.027 | 0.415 | 1.638 | 24.221 | 3.531 |
| 100 | 100.2 | 4 | 10.525 | 33.722 | 25.864 | 85 | 22.793 | 0.412 | 1.862 | 24.734 | 3.449 |
| 150 | 150.1 | 3 | 10.353 | 33.770 | 25.931 | 85 | 24.565 | 0.359 | 1.788 | 27.577 | 3.107 |
| 200 | 201.5 | 2 | 9.719 | 33.874 | 26.120 | 80 | 27.476 | 0.303 | 2.140 | 35.991 | 2.406 |
| 230 | 233.2 | 1 | 9.265 | 33.937 | 26.243 | 80 | 29.143 | 0.254 | 2.143 | 40.059 | 2.055 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAE0 (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 13.896 | 1.197 | 0 | 100 | 576.601 | 41.495 | 0 |
| 5 | 11 | 9.355 | 1.668 | 0 | 50 | 246.035 | 17.706 | 2 |
| 10 | 10 | 5.349 | 0.934 | 0 | 30 | 220.792 | 15.889 | 3 |
| 20 | 9 | 3.787 | 0.690 | 5 | 15 | 52.245 | 5.585 | 5 |
| 30 | 8 | 0.536 | 0.329 | 5 | 5 | 17.702 | 1.892 | 9 |
| 40 | 7 | 0.391 | 0.339 | 10 | 1 | 3.569 | 0.667 | 15 |
| 80 | 5 | 0.277 | 0.300 | 10 | 0.1 | 2.150 | 0.402 | 26 |
| 100 | 4 | 0.214 | 0.273 | | | | | |
| 150 | 3 | 0.153 | 0.227 | | | | | |
| 200 | 2 | 0.099 | 0.238 | | | | | |
| 230 | 1 | 0.077 | 0.205 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|--------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 148.15 | mg m-2 day -1 | Carbon Fixation: | 1571.0 | mg m-2 day-1 |
| Phaeophytin: | 20.86 | mg m-2 day -1 | Productivity Index: | 10.60 | mg C mg Chl day-1 |
| Mixed Layer | 205 | meters | PBOpt: | 41.49 | mg C mg Chl day-1 |

Date: Nov 06, 2007 14:32 Cruise: **S407** Latitude: 36.735 Year: 2007
 Project: PACOOS Station: **H3** Longitude: -122.021 Work week: 45
 Platform: D.S. JORDAN Cast: **2** Secchi Depth: 15 Day of Year: 310

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.4 | 12 | 13.243 | 33.248 | 24.988 | 86 | 5.754 | 0.236 | 0.477 | 5.553 | 5.931 |
| 5 | 6.9 | 11 | 12.877 | 33.267 | 25.075 | 86 | 7.215 | 0.337 | 1.020 | 6.710 | 5.780 |
| 10 | 10.8 | 10 | 12.723 | 33.271 | 25.108 | 86 | 7.825 | 0.278 | 0.703 | 7.067 | 5.737 |
| 20 | 20.4 | 9 | 12.239 | 33.285 | 25.212 | 85 | 10.344 | 0.280 | 0.762 | 9.652 | 5.571 |
| 30 | 30.7 | 8 | 11.602 | 33.272 | 25.321 | 87 | 11.782 | 0.258 | 0.721 | 10.380 | 5.206 |
| 40 | 40.7 | 7 | 10.390 | 33.258 | 25.526 | 88 | 15.832 | 0.177 | 1.018 | 12.990 | 4.803 |
| 60 | 60.8 | 6 | 10.467 | 33.645 | 25.814 | 88 | 22.543 | 0.265 | 1.709 | 21.798 | 3.697 |
| 80 | 81.9 | 5 | 10.267 | 33.699 | 25.891 | 88 | 23.021 | 0.169 | 1.442 | 23.558 | 3.444 |
| 100 | 101.3 | 4 | 9.853 | 33.782 | 26.025 | 88 | 25.277 | 0.133 | 2.164 | 26.564 | 2.968 |
| 150 | 151.0 | 3 | 9.455 | 33.862 | 26.154 | 87 | 26.435 | 0.058 | 1.774 | 29.224 | 2.607 |
| 200 | 200.8 | 2 | 8.883 | 34.022 | 26.370 | 88 | 29.979 | 0.086 | 2.047 | 36.413 | 1.931 |
| 1000 | 1019.1 | 1 | 3.677 | 34.467 | 27.395 | 86 | 43.678 | 0.120 | 3.513 | 129.26 | 0.614 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.736 | 0.282 | 0 | 100 | 54.441 | 74.003 | 0 |
| 5 | 11 | 0.602 | 0.184 | 5 | 50 | 27.980 | 46.467 | 6 |
| 10 | 10 | 0.636 | 0.238 | 10 | 30 | 28.131 | 44.249 | 11 |
| 20 | 9 | 0.908 | 0.338 | 20 | 15 | 18.142 | 19.976 | 16 |
| 30 | 8 | 0.426 | 0.270 | 30 | 5 | 2.909 | 6.829 | 25 |
| 40 | 7 | 0.184 | 0.107 | 40 | 1 | 0.245 | 1.329 | 42 |
| 60 | 6 | 0.220 | 0.169 | 60 | 0.1 | 0.099 | 0.451 | 71 |
| 80 | 5 | 0.193 | 0.172 | | | | | |
| 100 | 4 | 0.105 | 0.148 | | | | | |
| 150 | 3 | 0.044 | 0.097 | | | | | |
| 200 | 2 | 0.018 | 0.065 | | | | | |
| 1000 | 1 | 0.014 | 0.079 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 22.25 | mg m-2 day -1 | Carbon Fixation: | 625.59 | mg m-2 day-1 |
| Phaeophytin: | 9.85 | mg m-2 day -1 | Productivity Index: | 28.12 | mg C mg Chl day-1 |
| Mixed Layer | 923 | meters | PBOpt: | 74. | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|----------------------|---------------|----------|--------------|------|
| Date | Nov 06, 2007 17:20 | Cruise: S407 | Latitude: | 36.712 | Year: | 2007 |
| Project: | PACOOS | Station: NPS1 | Longitude: | -122.236 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 3 | Secchi Depth: | --- | Day of Year: | 310 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.2 | 12 | 15.531 | 33.094 | 24.387 | 85 | 0.270 | 0.058 | 0.084 | 0.264 | 5.692 |
| 50 | 52.4 | 11 | 12.409 | 33.229 | 25.136 | 87 | 9.425 | 0.333 | 0.630 | 6.707 | 5.461 |
| 100 | 102.1 | 10 | 9.461 | 33.602 | 25.950 | 89 | 22.623 | 0.085 | 1.494 | 22.010 | 3.743 |
| 200 | 202.0 | 9 | 7.896 | 34.019 | 26.519 | 89 | --- | --- | --- | --- | 0.874 |
| 300 | 302.7 | 8 | 7.614 | 34.114 | 26.635 | 89 | 37.940 | 0.205 | 3.111 | 53.269 | 1.127 |
| 395 | 400.7 | 7 | 6.612 | 34.182 | 26.827 | 89 | 38.050 | 0.075 | 2.781 | 66.847 | 0.760 |
| 500 | 503.9 | 6 | 6.082 | 34.236 | 26.938 | 89 | 39.824 | 0.048 | 2.772 | 77.155 | 0.481 |
| 600 | 604.4 | 5 | 5.247 | 34.256 | 27.057 | 89 | 42.166 | 0.048 | 3.185 | 89.409 | 0.355 |
| 700 | 704.3 | 4 | 4.810 | 34.332 | 27.167 | 89 | 43.333 | 0.041 | 3.000 | 101.71 | 0.254 |
| 800 | 803.3 | 3 | 4.477 | 34.382 | 27.244 | 88 | 43.676 | 0.036 | 3.170 | 110.51 | 0.290 |
| 900 | 901.7 | 2 | 4.157 | 34.419 | 27.308 | 88 | 43.845 | 0.039 | 3.146 | 117.28 | 0.366 |
| 1000 | 1000.8 | 1 | 3.790 | 34.461 | 27.378 | 88 | 44.182 | 0.041 | 3.015 | 125.51 | 0.471 |

Date: Nov 06, 2007 19:43 Cruise: **S407** Latitude: 36.627 Year: 2007
 Project: PACOOS Station: **67-55** Longitude: -122.419 Work week: 45
 Platform: D.S. JORDAN Cast: **4** Secchi Depth: 18 Day of Year: 310

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.4 | 12 | 15.701 | 32.950 | 24.238 | 85 | 0.079 | 0.036 | 0.050 | 0.685 | 5.675 |
| 5 | 6.2 | 11 | 15.702 | 32.950 | 24.238 | 85 | 0.053 | 0.037 | 0.142 | 0.292 | 5.670 |
| 10 | 11.1 | 10 | 15.693 | 32.949 | 24.239 | 85 | 0.047 | 0.046 | 0.233 | 0.047 | 5.676 |
| 20 | 22.1 | 9 | 14.151 | 33.001 | 24.612 | 86 | 2.337 | 0.154 | 0.241 | 1.274 | 5.882 |
| 30 | 30.7 | 8 | 13.127 | 33.107 | 24.902 | 87 | 10.351 | 0.585 | 0.709 | 11.311 | 5.844 |
| 40 | 40.9 | 7 | 11.987 | 32.927 | 24.982 | 87 | 9.326 | 1.382 | 0.786 | 13.499 | 5.833 |
| 60 | 60.1 | 6 | 10.944 | 33.247 | 25.420 | 88 | --- | --- | --- | --- | 4.851 |
| 80 | 80.2 | 5 | 10.754 | 33.554 | 25.693 | 88 | --- | --- | --- | --- | 4.116 |
| 100 | 100.8 | 4 | 9.590 | 33.628 | 25.949 | 89 | --- | --- | --- | --- | 3.655 |
| 150 | 150.8 | 3 | 8.594 | 33.870 | 26.297 | 89 | --- | --- | --- | --- | 2.966 |
| 200 | 201.1 | 2 | 8.041 | 33.997 | 26.480 | 89 | --- | --- | --- | --- | 2.312 |
| 1000 | 1005.7 | 1 | 3.853 | 34.450 | 27.364 | 89 | 42.623 | 1.729 | 2.752 | 109.59 | 0.420 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.380 | 0.122 | 0 | 100 | 18.346 | 48.325 | 0 |
| 5 | 11 | 0.381 | 0.119 | 5 | 50 | 16.290 | 42.705 | 8 |
| 10 | 10 | 0.416 | 0.145 | 10 | 30 | 14.750 | 35.461 | 13 |
| 20 | 9 | 0.582 | 0.180 | 20 | 15 | 12.202 | 20.959 | 20 |
| 30 | 8 | 0.550 | 0.242 | 30 | 5 | 3.960 | 7.194 | 30 |
| 40 | 7 | 0.462 | 0.217 | 40 | 1 | 0.735 | 1.590 | 46 |
| 60 | 6 | 0.164 | 0.113 | 80 | 0.1 | 0.003 | 0.057 | 78 |
| 80 | 5 | 0.047 | 0.054 | | | | | |
| 100 | 4 | 0.012 | 0.019 | | | | | |
| 150 | 3 | 0.004 | 0.016 | | | | | |
| 200 | 2 | 0.004 | 0.017 | | | | | |
| 1000 | 1 | 0.005 | 0.012 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 22.34 | mg m-2 day -1 | Carbon Fixation: | 422.41 | mg m-2 day-1 |
| Phaeophytin: | 8.57 | mg m-2 day -1 | Productivity Index: | 18.91 | mg C mg Chl day-1 |
| Mixed Layer | 18 | meters | PBOpt: | 48.33 | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|----------------------|---------------|----------|--------------|------|
| Date | Nov 06, 2007 22:56 | Cruise: S407 | Latitude: | 36.544 | Year: | 2007 |
| Project: | PACOOS | Station: NPS2 | Longitude: | -122.598 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 5 | Secchi Depth: | --- | Day of Year: | 310 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.3 | 12 | 14.056 | 32.685 | 24.387 | 86 | --- | --- | --- | --- | 0.688 |
| 50 | 50.5 | 11 | 11.543 | 32.886 | 25.032 | 87 | --- | --- | --- | --- | 1.212 |
| 100 | 105.6 | 10 | 9.297 | 33.392 | 25.812 | 89 | --- | --- | --- | --- | 0.816 |
| 200 | 202.1 | 9 | 8.094 | 33.729 | 26.261 | 89 | --- | --- | --- | --- | 0.907 |
| 300 | 305.0 | 8 | 7.000 | 34.063 | 26.681 | 89 | 34.982 | 0.080 | 3.065 | 54.510 | 0.993 |
| 400 | 395.3 | 7 | 6.134 | 34.101 | 26.825 | 89 | 33.962 | 0.256 | 2.164 | 55.353 | 0.762 |
| 500 | 493.2 | 6 | 5.590 | 34.181 | 26.956 | 89 | --- | --- | --- | --- | 0.585 |
| 600 | 603.7 | 5 | 4.977 | 34.260 | 27.091 | 89 | --- | --- | --- | --- | 0.313 |
| 700 | 698.0 | 4 | 4.908 | 34.364 | 27.182 | 89 | 42.549 | 0.045 | 2.770 | 100.59 | 0.254 |
| 800 | 794.9 | 3 | 4.565 | 34.392 | 27.242 | 89 | 44.232 | 0.101 | 3.172 | 107.60 | 0.288 |
| 900 | 899.2 | 2 | 4.238 | 34.429 | 27.307 | 89 | --- | --- | --- | --- | 0.358 |
| 1000 | 1000.9 | 1 | 3.915 | 34.454 | 27.360 | 89 | 38.849 | 0.112 | 3.317 | 111.45 | 0.444 |

Date: Nov 07, 2007 01:15 Cruise: **S407** Latitude: 36.460 Year: 2007
 Project: PACOOS Station: **67-60** Longitude: -122.778 Work week: 45
 Platform: D.S. JORDAN Cast: **6** Secchi Depth: 18 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.3 | 12 | 15.637 | 32.964 | 24.263 | 86 | 0.194 | 0.033 | 0.294 | 0.825 | 5.653 |
| 5 | 5.9 | 11 | 15.634 | 32.962 | 24.262 | 86 | 0.184 | 0.038 | 0.158 | 0.723 | 5.653 |
| 10 | 10.1 | 10 | 14.661 | 32.918 | 24.440 | 86 | 0.889 | 0.089 | 0.313 | 1.111 | 5.839 |
| 20 | 20.5 | 9 | 13.923 | 32.956 | 24.624 | 87 | 2.398 | 0.164 | 0.383 | 1.584 | 5.863 |
| 30 | 30.8 | 8 | 13.598 | 33.038 | 24.754 | 87 | 3.946 | 0.234 | 0.472 | 2.133 | 5.855 |
| 40 | 41.4 | 7 | 13.511 | 33.125 | 24.839 | 87 | 4.774 | 0.277 | 0.683 | 2.291 | 5.800 |
| 60 | 60.5 | 6 | 10.636 | 32.893 | 25.199 | 88 | 7.628 | 0.127 | 0.934 | 6.045 | 5.600 |
| 80 | 80.4 | 5 | 10.362 | 33.239 | 25.516 | 89 | 13.919 | 0.061 | 1.063 | 11.781 | 4.866 |
| 100 | 100.0 | 4 | 9.820 | 33.538 | 25.841 | 89 | 20.744 | 0.058 | 1.632 | 20.036 | 3.911 |
| 150 | 149.6 | 3 | 8.739 | 33.882 | 26.284 | 89 | 26.545 | 0.031 | 1.743 | 30.288 | 2.889 |
| 200 | 200.2 | 2 | 8.367 | 34.019 | 26.448 | 89 | 28.776 | 0.041 | 1.996 | 37.197 | 2.480 |
| 1000 | 1010.1 | 1 | 3.875 | 34.463 | 27.372 | 89 | 44.266 | 0.045 | 3.000 | 122.62 | 0.472 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.346 | 0.099 | 0 | 100 | 19.557 | 56.519 | 0 |
| 5 | 11 | 0.373 | 0.101 | 5 | 50 | 20.876 | 55.926 | 8 |
| 10 | 10 | 0.502 | 0.174 | 10 | 30 | 21.838 | 43.482 | 13 |
| 20 | 9 | 0.438 | 0.213 | 20 | 15 | 10.172 | 23.237 | 20 |
| 30 | 8 | 0.430 | 0.185 | 30 | 5 | 3.373 | 7.836 | 31 |
| 40 | 7 | 0.360 | 0.161 | 40 | 1 | 0.589 | 1.638 | 49 |
| 60 | 6 | 0.203 | 0.165 | 60 | 0.1 | 0.083 | 0.408 | 80 |
| 80 | 5 | 0.054 | 0.056 | | | | | |
| 100 | 4 | 0.008 | 0.023 | | | | | |
| 150 | 3 | 0.005 | 0.015 | | | | | |
| 200 | 2 | 0.003 | 0.017 | | | | | |
| 1000 | 1 | 0.002 | 0.013 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 20.08 | mg m-2 day -1 | Carbon Fixation: | 485.90 | mg m-2 day-1 |
| Phaeophytin: | 8.09 | mg m-2 day -1 | Productivity Index: | 24.19 | mg C mg Chl day-1 |
| Mixed Layer | 53 | meters | PBOpt: | 56.52 | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|----------------------|---------------|----------|--------------|------|
| Date | Nov 07, 2007 04:04 | Cruise: S407 | Latitude: | 36.380 | Year: | 2007 |
| Project: | PACOOS | Station: NPS3 | Longitude: | -122.952 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 7 | Secchi Depth: | 18 | Day of Year: | 311 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (µM) | NO2 (µM) | PO4 (µM) | SIO4 (µM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.3 | 12 | 14.159 | 32.934 | 24.558 | 86 | 2.008 | 0.112 | 0.140 | 1.904 | 5.854 |
| 50 | 52.6 | 11 | 10.060 | 32.817 | 25.238 | 88 | 10.407 | 0.087 | 0.677 | 8.616 | 5.538 |
| 100 | 102.9 | 10 | 9.530 | 33.702 | 26.016 | 89 | 24.660 | 0.116 | 2.063 | 25.161 | 3.337 |
| 200 | 203.5 | 9 | 7.876 | 34.006 | 26.511 | 89 | 21.501 | 0.108 | 2.005 | 30.157 | 2.535 |
| 300 | 303.7 | 8 | 6.839 | 34.091 | 26.725 | 89 | 36.078 | 0.055 | 2.523 | 58.468 | 1.278 |
| 400 | 403.9 | 7 | 6.074 | 34.127 | 26.853 | 89 | 39.171 | 0.148 | 2.937 | 71.894 | 0.873 |
| 500 | 502.8 | 6 | 5.588 | 34.233 | 26.997 | 89 | 41.452 | 0.032 | 2.953 | 85.239 | 0.430 |
| 600 | 605.3 | 5 | 4.913 | 34.279 | 27.114 | 89 | 42.959 | 0.090 | 3.115 | 99.733 | 0.286 |
| 700 | 705.0 | 4 | 4.503 | 34.320 | 27.192 | 89 | 43.835 | 0.020 | 3.126 | 108.08 | 0.244 |
| 800 | 805.8 | 3 | 4.390 | 34.410 | 27.276 | 89 | 43.859 | 0.034 | 3.333 | 111.70 | 0.317 |
| 900 | 902.6 | 2 | 4.098 | 34.431 | 27.323 | 89 | 43.583 | 0.014 | 3.171 | 118.14 | 0.382 |
| 1000 | 1024.1 | 1 | 3.856 | 34.463 | 27.374 | 89 | 44.283 | 0.105 | 3.413 | 124.05 | 0.483 |

Date: Nov 07, 2007 06:29 Cruise: **S407** Latitude: 36.296 Year: 2007
 Project: PACOOS Station: **67-65** Longitude: -123.129 Work week: 45
 Platform: D.S. JORDAN Cast: **8** Secchi Depth: 18 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.1 | 12 | 14.567 | 33.134 | 24.626 | 85 | 2.199 | 0.106 | 0.101 | 1.261 | 5.829 |
| 10 | 8.9 | 11 | 14.569 | 33.134 | 24.626 | 85 | 2.219 | 0.138 | 0.230 | 1.180 | 5.834 |
| 15 | 13.1 | 10 | 14.566 | 33.133 | 24.626 | 85 | 2.066 | 0.105 | 0.034 | 1.082 | 5.824 |
| 25 | 23.4 | 9 | 14.572 | 33.132 | 24.624 | 85 | 2.346 | 0.141 | 0.322 | 1.244 | 5.828 |
| 35 | 33.5 | 8 | 14.087 | 33.140 | 24.732 | 86 | 2.810 | 0.144 | 0.261 | 1.344 | 5.702 |
| 40 | 42.5 | 7 | 12.427 | 33.300 | 25.188 | 87 | 11.549 | 0.668 | 0.739 | 8.654 | 5.085 |
| 60 | 62.8 | 6 | 10.071 | 33.292 | 25.607 | 88 | 17.614 | 0.049 | 1.237 | 16.599 | 4.570 |
| 80 | 82.3 | 5 | 10.139 | 33.568 | 25.810 | 88 | 22.478 | 0.010 | 1.477 | 22.620 | 3.719 |
| 100 | 101.7 | 4 | 9.257 | 33.751 | 26.099 | 88 | 25.740 | 0.016 | 2.107 | 28.363 | 2.989 |
| 150 | 150.1 | 3 | 8.290 | 33.915 | 26.378 | 89 | 23.155 | 0.031 | 1.571 | 28.542 | 3.045 |
| 200 | 199.2 | 2 | 7.800 | 33.997 | 26.515 | 89 | 31.303 | 0.080 | 2.495 | 43.007 | 2.190 |
| 1000 | 1018.5 | 1 | 3.792 | 34.472 | 27.387 | 89 | 44.041 | 0.025 | 3.307 | 125.80 | 0.513 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.559 | 0.165 | 0 | 100 | 36.881 | 65.922 | 0 |
| 10 | 11 | 0.571 | 0.159 | 10 | 50 | 32.822 | 57.454 | 7 |
| 15 | 10 | 0.589 | 0.142 | 15 | 30 | 26.056 | 44.274 | 11 |
| 25 | 9 | 0.549 | 0.175 | 25 | 15 | 15.286 | 27.819 | 18 |
| 35 | 8 | 0.485 | 0.181 | 35 | 5 | 4.759 | 9.812 | 29 |
| 40 | 7 | 0.418 | 0.201 | 40 | 1 | 0.671 | 1.605 | 45 |
| 60 | 6 | 0.142 | 0.100 | 60 | 0.1 | 0.004 | 0.028 | 77 |
| 80 | 5 | 0.088 | 0.104 | | | | | |
| 100 | 4 | 0.012 | 0.076 | | | | | |
| 150 | 3 | 0.002 | 0.032 | | | | | |
| 200 | 2 | 0.001 | 0.019 | | | | | |
| 1000 | 1 | 0.002 | 0.013 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 23.33 | mg m-2 day -1 | Carbon Fixation: | 658.28 | mg m-2 day-1 |
| Phaeophytin: | 7.95 | mg m-2 day -1 | Productivity Index: | 28.22 | mg C mg Chl day-1 |
| Mixed Layer | 311 | meters | PBOpt: | 65.92 | mg C mg Chl day-1 |

Date: Nov 07, 2007 09:10 Cruise: **S407** Latitude: 36.209 Year: 2007
 Project: PACOOS Station: **NPS4** Longitude: -123.312 Work week: 45
 Platform: D.S. JORDAN Cast: **9** Secchi Depth: --- Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.2 | 12 | 14.896 | 33.123 | 24.548 | 85 | 1.103 | 0.103 | 0.084 | 1.615 | 5.765 |
| 50 | 53.2 | 11 | 10.241 | 32.768 | 25.169 | 88 | --- | --- | --- | --- | 5.686 |
| 100 | 102.9 | 10 | 9.982 | 33.716 | 25.952 | 89 | 23.439 | 0.076 | 1.759 | 31.212 | 3.315 |
| 200 | 202.9 | 9 | 7.970 | 34.027 | 26.514 | 89 | --- | --- | --- | --- | 1.935 |
| 300 | 302.6 | 8 | 6.553 | 34.027 | 26.713 | 89 | 36.047 | 0.108 | 2.504 | 59.809 | 1.579 |
| 400 | 404.1 | 7 | 5.711 | 34.091 | 26.870 | 89 | 39.180 | --- | 2.800 | 74.613 | 1.049 |
| 500 | 502.7 | 6 | 5.322 | 34.212 | 27.013 | 89 | 41.554 | 0.050 | 2.935 | 88.534 | 0.434 |
| 600 | 604.4 | 5 | 4.776 | 34.279 | 27.129 | 89 | --- | 0.046 | --- | 92.369 | 0.275 |
| 700 | 704.6 | 4 | 4.722 | 34.370 | 27.207 | 89 | --- | 0.074 | --- | 93.017 | 0.258 |
| 800 | 802.5 | 3 | 4.386 | 34.414 | 27.279 | 89 | --- | 0.047 | --- | 106.92 | 0.322 |
| 900 | 895.9 | 2 | 4.137 | 34.442 | 27.328 | 89 | --- | 0.152 | --- | 107.52 | 0.395 |
| 1000 | 1005.9 | 1 | 3.793 | 34.479 | 27.393 | 89 | --- | 0.146 | --- | 113.15 | 0.548 |

Date: Nov 07, 2007 11:20 Cruise: **S407** Latitude: 36.127 Year: 2007
 Project: PACOOS Station: **67-70** Longitude: -123.490 Work week: 45
 Platform: D.S. JORDAN Cast: **10** Secchi Depth: 18 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.9 | 12 | 14.667 | 32.804 | 24.351 | 86 | 0.871 | 0.087 | 0.156 | 0.696 | 5.777 |
| 5 | 5.5 | 11 | 14.668 | 32.804 | 24.351 | 86 | 0.902 | 0.088 | 0.276 | 0.495 | 5.784 |
| 10 | 10.2 | 10 | 14.676 | 32.805 | 24.350 | 86 | 0.784 | 0.066 | 0.298 | 0.408 | 5.782 |
| 20 | 20.5 | 9 | 14.635 | 32.889 | 24.423 | 86 | 1.100 | 0.124 | 0.505 | 0.723 | 5.788 |
| 30 | 30.3 | 8 | 14.298 | 32.971 | 24.557 | 86 | 1.927 | 0.169 | 0.440 | 1.380 | 5.792 |
| 40 | 41.0 | 7 | 13.802 | 32.938 | 24.635 | 87 | 2.618 | 0.196 | 0.270 | 1.889 | 5.800 |
| 60 | 60.9 | 6 | 10.423 | 32.762 | 25.134 | 88 | 8.272 | 0.052 | 0.723 | 6.476 | 5.654 |
| 80 | 81.0 | 5 | 9.861 | 33.055 | 25.457 | 88 | 15.525 | 0.028 | 1.177 | 13.897 | 4.976 |
| 100 | 101.0 | 4 | 9.607 | 33.429 | 25.790 | 88 | 21.835 | 0.010 | 1.470 | 22.241 | 4.218 |
| 150 | 150.8 | 3 | 8.782 | 33.890 | 26.284 | 89 | 26.891 | 0.010 | 1.736 | 31.023 | 2.795 |
| 200 | 203.8 | 2 | 8.126 | 34.003 | 26.472 | 89 | 30.973 | 0.010 | 2.071 | 40.354 | 2.105 |
| 1000 | 1007.1 | 1 | 3.798 | 34.469 | 27.385 | 89 | 44.024 | 0.018 | 3.320 | 124.86 | 0.503 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.404 | 0.168 | 0 | 100 | 21.770 | 53.866 | 0 |
| 5 | 11 | 0.386 | 0.161 | 5 | 50 | 18.741 | 48.552 | 7 |
| 10 | 10 | 0.404 | 0.160 | 10 | 30 | 14.805 | 36.633 | 13 |
| 20 | 9 | 0.358 | 0.156 | 20 | 15 | 10.196 | 28.494 | 20 |
| 30 | 8 | 0.440 | 0.225 | 30 | 5 | 4.193 | 9.518 | 32 |
| 40 | 7 | 0.412 | 0.229 | 40 | 1 | 0.778 | 1.886 | 48 |
| 60 | 6 | 0.219 | 0.158 | 60 | 0.1 | 0.064 | 0.294 | 77 |
| 80 | 5 | 0.130 | 0.094 | | | | | |
| 100 | 4 | 0.056 | 0.073 | | | | | |
| 150 | 3 | 0.004 | 0.027 | | | | | |
| 200 | 2 | 0.002 | 0.023 | | | | | |
| 1000 | 1 | 0.002 | 0.016 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 19.59 | mg m-2 day -1 | Carbon Fixation: | 456.93 | mg m-2 day-1 |
| Phaeophytin: | 9.23 | mg m-2 day -1 | Productivity Index: | 23.33 | mg C mg Chl day-1 |
| Mixed Layer | 39 | meters | PBOpt: | 53.87 | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|----------------------|---------------|----------|--------------|------|
| Date | Nov 07, 2007 13:59 | Cruise: S407 | Latitude: | 36.043 | Year: | 2007 |
| Project: | PACOOS | Station: NPS5 | Longitude: | -123.668 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 11 | Secchi Depth: | --- | Day of Year: | 311 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.4 | 12 | 14.854 | 32.752 | 24.271 | 86 | 0.608 | 0.083 | 0.281 | 0.650 | 5.773 |
| 50 | 50.4 | 11 | 11.224 | 32.663 | 24.916 | 88 | 3.593 | 0.368 | 0.643 | 3.686 | 6.099 |
| 100 | 100.7 | 10 | 9.562 | 33.081 | 25.526 | 88 | 15.529 | 0.064 | 1.200 | 14.624 | 4.951 |
| 200 | 203.9 | 9 | 8.072 | 33.978 | 26.461 | 89 | 29.843 | 0.063 | 1.864 | 37.727 | 2.483 |
| 300 | 301.7 | 8 | 7.337 | 34.099 | 26.662 | 89 | 35.114 | 0.055 | 2.318 | 54.080 | 1.364 |
| 400 | 400.6 | 7 | 6.277 | 34.122 | 26.823 | 89 | 38.493 | 0.064 | 2.737 | 70.124 | 0.927 |
| 500 | 503.5 | 6 | 5.472 | 34.182 | 26.971 | 89 | 41.575 | 0.070 | 2.961 | 87.595 | 0.536 |
| 600 | 601.5 | 5 | 4.878 | 34.248 | 27.093 | 89 | 43.324 | 0.063 | 3.130 | 100.43 | 0.318 |
| 700 | 702.9 | 4 | 4.641 | 34.341 | 27.193 | 89 | 43.940 | 0.050 | 3.003 | 108.26 | 0.246 |
| 800 | 796.3 | 3 | 4.450 | 34.407 | 27.266 | 89 | 44.189 | 0.055 | 3.077 | 114.29 | 0.307 |
| 900 | 895.7 | 2 | 4.151 | 34.433 | 27.319 | 89 | 44.547 | 0.112 | 3.212 | 120.73 | 0.368 |
| 1000 | 1015.3 | 1 | 3.778 | 34.472 | 27.389 | 89 | 44.641 | 0.066 | 3.193 | 126.96 | 0.516 |

Date: Nov 07, 2007 16:14 Cruise: **S407** Latitude: 35.959 Year: 2007
 Project: PACOOS Station: **67-75** Longitude: -123.848 Work week: 45
 Platform: D.S. JORDAN Cast: **12** Secchi Depth: 22 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.1 | 12 | 15.024 | 32.674 | 24.174 | 87 | 0.130 | 0.054 | 0.032 | 0.676 | 5.729 |
| 5 | 7.4 | 11 | 15.022 | 32.673 | 24.174 | 87 | 0.104 | 0.053 | 0.198 | 0.477 | 5.726 |
| 10 | 13.1 | 10 | 15.024 | 32.673 | 24.174 | 87 | 0.146 | 0.056 | 0.333 | 0.429 | 5.722 |
| 20 | 22.8 | 9 | 15.023 | 32.673 | 24.174 | 87 | 0.122 | 0.058 | 0.127 | 0.359 | 5.729 |
| 30 | 32.6 | 8 | 15.013 | 32.675 | 24.177 | 87 | 0.226 | 0.069 | 0.461 | 0.163 | 5.720 |
| 40 | 42.8 | 7 | 13.819 | 32.690 | 24.440 | 87 | 1.717 | 0.258 | 0.512 | 1.781 | 6.025 |
| 60 | 62.6 | 6 | 10.882 | 32.682 | 24.992 | 88 | 4.552 | 0.087 | 0.551 | 3.624 | 5.952 |
| 80 | 82.5 | 5 | 10.546 | 32.796 | 25.139 | 88 | 5.494 | 0.053 | 0.587 | 3.243 | 5.800 |
| 100 | 102.8 | 4 | 9.798 | 32.939 | 25.377 | 88 | 11.389 | 0.046 | 0.914 | 9.753 | 5.378 |
| 150 | 152.9 | 3 | 8.949 | 33.658 | 26.075 | 89 | 22.863 | 0.022 | 1.315 | 24.908 | 3.951 |
| 200 | 202.2 | 2 | 8.593 | 34.000 | 26.398 | 89 | 29.800 | 0.036 | 1.819 | 36.670 | 2.213 |
| 1000 | 1028.4 | 1 | 3.683 | 34.458 | 27.387 | 89 | 44.630 | 0.029 | 2.859 | 130.21 | 0.459 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.275 | 0.141 | 0 | 100 | 14.499 | 52.686 | 0 |
| 5 | 11 | 0.270 | 0.142 | 10 | 50 | 12.843 | 48.427 | 8 |
| 10 | 10 | 0.265 | 0.136 | 20 | 30 | 10.254 | 39.754 | 15 |
| 20 | 9 | 0.258 | 0.132 | 20 | 15 | 6.595 | 25.570 | 23 |
| 30 | 8 | 0.259 | 0.167 | 40 | 5 | 3.078 | 9.233 | 36 |
| 40 | 7 | 0.333 | 0.237 | 60 | 1 | 0.450 | 2.358 | 54 |
| 60 | 6 | 0.191 | 0.152 | 80 | 0.1 | -0.015 | -0.172 | 89 |
| 80 | 5 | 0.085 | 0.091 | | | | | |
| 100 | 4 | 0.026 | 0.030 | | | | | |
| 150 | 3 | 0.006 | 0.023 | | | | | |
| 200 | 2 | 0.003 | 0.026 | | | | | |
| 1000 | 1 | 0.004 | 0.013 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 14.71 | mg m-2 day -1 | Carbon Fixation: | 352.73 | mg m-2 day-1 |
| Phaeophytin: | 9.07 | mg m-2 day -1 | Productivity Index: | 23.98 | mg C mg Chl day-1 |
| Mixed Layer | 341 | meters | PBOpt: | 52.69 | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|----------------------|---------------|----------|--------------|------|
| Date | Nov 07, 2007 18:59 | Cruise: S407 | Latitude: | 35.877 | Year: | 2007 |
| Project: | PACOOS | Station: NPS6 | Longitude: | -124.022 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 13 | Secchi Depth: | 21 | Day of Year: | 311 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (µM) | NO2 (µM) | PO4 (µM) | SIO4 (µM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.8 | 12 | 15.216 | 32.691 | 24.145 | 86 | 0.003 | 0.026 | 0.072 | 0.545 | 5.711 |
| 0 | 2.9 | 11 | 15.214 | 32.690 | 24.145 | 86 | 0.020 | 0.031 | 0.184 | 0.342 | 5.714 |
| 50 | 52.9 | 10 | 12.552 | 32.893 | 24.848 | 88 | 3.479 | 0.308 | 0.454 | 2.640 | 5.901 |
| 100 | 102.2 | 9 | 10.175 | 32.960 | 25.330 | 88 | 9.966 | 0.071 | 0.774 | 7.743 | 5.398 |
| 200 | 202.1 | 8 | 8.639 | 33.957 | 26.358 | 89 | 26.485 | 0.066 | 1.605 | 32.291 | 2.894 |
| 300 | 303.7 | 7 | 7.288 | 34.040 | 26.623 | 89 | 29.809 | 0.068 | 2.081 | 44.551 | 1.908 |
| 400 | 403.8 | 6 | 6.367 | 34.101 | 26.795 | 89 | 37.917 | 0.066 | 2.652 | 66.673 | 1.085 |
| 500 | 504.3 | 5 | 5.600 | 34.171 | 26.947 | 89 | 40.579 | 0.045 | 2.821 | 83.136 | 0.604 |
| 600 | 605.0 | 4 | 4.964 | 34.230 | 27.069 | 89 | 42.421 | 0.034 | 2.923 | 97.852 | 0.351 |
| 700 | 705.3 | 3 | 4.625 | 34.317 | 27.176 | 89 | 43.131 | 0.032 | 3.052 | 107.12 | 0.237 |
| 900 | 905.8 | 2 | 4.024 | 34.415 | 27.318 | 89 | 44.452 | 0.023 | 3.114 | 121.99 | 0.332 |
| 1000 | 1027.5 | 1 | 3.763 | 34.467 | 27.386 | 89 | 43.352 | 0.043 | 3.024 | 127.56 | 0.507 |

Date: Nov 07, 2007 21:08 Cruise: **S407** Latitude: 35.793 Year: 2007
 Project: PACOOS Station: **67-80** Longitude: -124.200 Work week: 45
 Platform: D.S. JORDAN Cast: **14** Secchi Depth: 14 Day of Year: 311

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.6 | 12 | 14.936 | 32.864 | 24.339 | 84 | 0.393 | 0.067 | 0.153 | 0.427 | 5.822 |
| 5 | 7.7 | 11 | 15.142 | 33.002 | 24.401 | 84 | 0.224 | 0.051 | 0.213 | 0.235 | 5.785 |
| 10 | 12.7 | 10 | 15.170 | 33.094 | 24.466 | 85 | 0.268 | 0.049 | 0.231 | 0.372 | 5.771 |
| 20 | 22.9 | 9 | 15.070 | 33.120 | 24.508 | 86 | 0.559 | 0.061 | 0.088 | 0.557 | 5.745 |
| 30 | 32.6 | 8 | 14.771 | 33.101 | 24.558 | 86 | 0.758 | 0.069 | 0.053 | 0.662 | 5.753 |
| 40 | 42.9 | 7 | 13.981 | 33.060 | 24.692 | 87 | 1.639 | 0.189 | 0.305 | 1.476 | 5.727 |
| 60 | 62.6 | 6 | 11.188 | 32.795 | 25.026 | 88 | 5.479 | 0.203 | 0.374 | 4.050 | 5.688 |
| 80 | 82.3 | 5 | 10.699 | 32.915 | 25.205 | 88 | 9.263 | 0.058 | 0.647 | 7.320 | 5.403 |
| 100 | 102.8 | 4 | 10.666 | 33.239 | 25.463 | 88 | 14.358 | 0.066 | 0.935 | 12.164 | 4.856 |
| 150 | 152.8 | 3 | 9.523 | 33.889 | 26.164 | 88 | 27.008 | 0.028 | 1.638 | 30.101 | 2.393 |
| 200 | 203.0 | 2 | 8.561 | 34.021 | 26.420 | 89 | 29.864 | 0.055 | 1.952 | 37.723 | 2.039 |
| 1000 | 1016.7 | 1 | 3.836 | 34.455 | 27.369 | 89 | 43.659 | 0.085 | 2.970 | 124.56 | 0.464 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.505 | 0.168 | 0 | 100 | 27.359 | 54.180 | 0 |
| 5 | 11 | 0.490 | 0.196 | 5 | 50 | 29.760 | 60.682 | 7 |
| 10 | 10 | 0.520 | 0.249 | 10 | 30 | 28.129 | 54.051 | 12 |
| 20 | 9 | 0.445 | 0.267 | 20 | 15 | 13.326 | 29.944 | 18 |
| 30 | 8 | 0.354 | 0.231 | 20 | 5 | 5.705 | 12.820 | 29 |
| 40 | 7 | 0.265 | 0.194 | 30 | 1 | 1.197 | 3.379 | 47 |
| 60 | 6 | 0.200 | 0.189 | 60 | 0.1 | 0.107 | 0.536 | 77 |
| 80 | 5 | 0.114 | 0.109 | | | | | |
| 100 | 4 | 0.038 | 0.046 | | | | | |
| 150 | 3 | 0.005 | 0.028 | | | | | |
| 200 | 2 | 0.003 | 0.026 | | | | | |
| 1000 | 1 | 0.001 | 0.009 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 20.94 | mg m-2 day -1 | Carbon Fixation: | 631.35 | mg m-2 day-1 |
| Phaeophytin: | 11.36 | mg m-2 day -1 | Productivity Index: | 30.15 | mg C mg Chl day-1 |
| Mixed Layer | 10 | meters | PBOpt: | 60.68 | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|----------------------|---------------|----------|--------------|------|
| Date | Nov 07, 2007 23:41 | Cruise: S407 | Latitude: | 35.710 | Year: | 2007 |
| Project: | PACOOS | Station: NPS7 | Longitude: | -124.375 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 15 | Secchi Depth: | --- | Day of Year: | 311 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (µM) | NO2 (µM) | PO4 (µM) | SIO4 (µM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.3 | 12 | 15.641 | 33.010 | 24.298 | 85 | 0.526 | 0.073 | 0.207 | 0.846 | 5.690 |
| 50 | 50.4 | 11 | 15.170 | 33.135 | 24.498 | 86 | 0.178 | 0.061 | 0.298 | 0.752 | 5.651 |
| 100 | 99.2 | 10 | 11.105 | 33.473 | 25.568 | 88 | 17.776 | 0.071 | 1.261 | 15.685 | 4.265 |
| 200 | 199.5 | 9 | 8.423 | 33.958 | 26.392 | 89 | 27.156 | 0.034 | 1.746 | 33.777 | 2.825 |
| 300 | 298.8 | 8 | 7.597 | 34.112 | 26.635 | 89 | 33.808 | 0.084 | 2.278 | 52.094 | 1.419 |
| 400 | 399.8 | 7 | 6.648 | 34.154 | 26.800 | 89 | 37.432 | 0.066 | 2.588 | 67.272 | 0.902 |
| 500 | 499.3 | 6 | 5.939 | 34.231 | 26.953 | 89 | 40.031 | 0.049 | 2.828 | 81.561 | 0.476 |
| 600 | 599.9 | 5 | 5.494 | 34.304 | 27.065 | 89 | 41.364 | 0.055 | 2.968 | 91.003 | 0.288 |
| 700 | 700.5 | 4 | 5.009 | 34.329 | 27.142 | 89 | 42.530 | 0.036 | 3.008 | 99.968 | 0.259 |
| 800 | 798.6 | 3 | 4.696 | 34.370 | 27.210 | 89 | 43.294 | 0.045 | 3.063 | 106.63 | 0.268 |
| 900 | 899.1 | 2 | 4.140 | 34.451 | 27.335 | 89 | 43.490 | 0.037 | 3.116 | 120.89 | 0.423 |
| 1000 | 1018.2 | 1 | 3.845 | 34.470 | 27.380 | 89 | 42.705 | 0.031 | 2.958 | 126.41 | 0.507 |

Date: Nov 08, 2007 01:55 Cruise: **S407** Latitude: 35.626 Year: 2007
 Project: PACOOS Station: **67-85** Longitude: -124.555 Work week: 45
 Platform: D.S. JORDAN Cast: **16** Secchi Depth: 14 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.5 | 12 | 15.392 | 32.870 | 24.245 | 85 | 0.347 | 0.064 | 0.087 | 0.892 | 5.737 |
| 5 | 5.7 | 11 | 15.399 | 32.869 | 24.243 | 85 | 0.027 | 0.048 | 0.084 | 0.615 | 5.738 |
| 10 | 10.8 | 10 | 15.376 | 32.868 | 24.247 | 85 | 0.170 | 0.077 | 0.224 | 0.436 | 5.741 |
| 20 | 20.7 | 9 | 15.207 | 32.880 | 24.293 | 85 | 0.178 | 0.071 | 0.255 | 0.687 | 5.783 |
| 30 | 30.6 | 8 | 14.825 | 32.862 | 24.362 | 85 | 0.408 | 0.063 | 0.122 | 0.679 | 5.808 |
| 40 | 40.4 | 7 | 13.170 | 32.751 | 24.618 | 86 | 1.536 | 0.205 | 0.287 | 2.009 | 6.062 |
| 60 | 60.3 | 6 | 10.784 | 32.699 | 25.022 | 88 | 5.137 | 0.160 | 0.488 | 3.974 | 5.924 |
| 80 | 80.6 | 5 | 10.593 | 32.876 | 25.193 | 88 | 8.360 | 0.072 | 0.627 | 6.659 | 5.561 |
| 100 | 99.8 | 4 | 11.215 | 33.437 | 25.520 | 88 | 16.474 | 0.128 | 1.233 | 14.142 | 4.450 |
| 150 | 151.3 | 3 | 8.726 | 33.795 | 26.217 | 88 | 24.849 | 0.072 | 1.672 | 28.895 | 3.266 |
| 200 | 200.8 | 2 | 8.280 | 33.964 | 26.419 | 89 | 26.933 | 0.032 | 1.609 | 34.469 | 2.955 |
| 1000 | 1028.0 | 1 | 3.748 | 34.464 | 27.385 | 89 | 44.243 | 0.051 | 2.823 | 126.03 | 0.486 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.361 | 0.098 | 0 | 100 | 12.108 | 33.496 | 0 |
| 5 | 11 | 0.341 | 0.097 | 5 | 50 | 14.289 | 41.953 | 8 |
| 10 | 10 | 0.380 | 0.111 | 10 | 30 | 14.532 | 38.279 | 14 |
| 20 | 9 | 0.546 | 0.149 | 20 | 15 | 15.622 | 28.620 | 21 |
| 30 | 8 | 0.495 | 0.154 | 20 | 5 | 6.818 | 12.490 | 31 |
| 40 | 7 | 0.470 | 0.220 | 30 | 1 | 1.415 | 2.859 | 48 |
| 60 | 6 | 0.250 | 0.157 | 60 | 0.1 | 0.123 | 0.493 | 76 |
| 80 | 5 | 0.123 | 0.089 | | | | | |
| 100 | 4 | 0.054 | 0.047 | | | | | |
| 150 | 3 | 0.004 | 0.007 | | | | | |
| 200 | 2 | 0.003 | 0.003 | | | | | |
| 1000 | 1 | 0.002 | 0.002 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 22.52 | mg m-2 day -1 | Carbon Fixation: | 480.89 | mg m-2 day-1 |
| Phaeophytin: | 6.36 | mg m-2 day -1 | Productivity Index: | 21.35 | mg C mg Chl day-1 |
| Mixed Layer | 725 | meters | PBOpt: | 41.95 | mg C mg Chl day-1 |

Date: Nov 08, 2007 04:41 Cruise: **S407** Latitude: 35.542 Year: 2007
 Project: PACOOS Station: **NPS8** Longitude: -124.733 Work week: 45
 Platform: D.S. JORDAN Cast: **17** Secchi Depth: --- Day of Year: 312

** Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.*

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.6 | 12 | 15.145 | 32.872 | 24.300 | 85 | 0.089 | 0.040 | 0.299 | 1.452 | 5.794 |
| 50 | 52.2 | 11 | 12.795 | 33.037 | 24.913 | 88 | 5.053 | 0.496 | 0.575 | 4.170 | 5.584 |
| 100 | 102.1 | 10 | 9.972 | 33.465 | 25.758 | 88 | 19.721 | 0.044 | 1.261 | 18.655 | 4.154 |
| 200 | 201.9 | 9 | 8.251 | 33.964 | 26.423 | 88 | 25.347 | 0.041 | 1.709 | 32.848 | 2.987 |
| 300 | 299.0 | 8 | 7.163 | 34.047 | 26.646 | 89 | 34.296 | 0.047 | 2.207 | 53.245 | 1.699 |
| 400 | 398.2 | 7 | 6.280 | 34.117 | 26.819 | 89 | 38.121 | 0.005 | 2.378 | 67.937 | 0.962 |
| 500 | 499.1 | 6 | 5.548 | 34.165 | 26.949 | 89 | 40.084 | 0.006 | 2.684 | 79.933 | 0.615 |
| 600 | 598.4 | 5 | 4.854 | 34.208 | 27.064 | 89 | 42.861 | 0.007 | 2.968 | 96.858 | 0.414 |
| 700 | 700.2 | 4 | 4.667 | 34.311 | 27.167 | 89 | 43.527 | 0.038 | 3.227 | 105.70 | 0.243 |
| 800 | 801.7 | 3 | 4.315 | 34.363 | 27.246 | 89 | 44.133 | 0.061 | 3.098 | 115.32 | 0.246 |
| 900 | 903.9 | 2 | 4.056 | 34.417 | 27.316 | 89 | 43.916 | 0.067 | 3.314 | 121.09 | 0.334 |
| 1000 | 1026.8 | 1 | 3.695 | 34.457 | 27.385 | 89 | 44.505 | 0.044 | 3.081 | 128.85 | 0.459 |

Date: Nov 08, 2007 06:59 Cruise: **S407** Latitude: 35.459 Year: 2007
 Project: PACOOS Station: **67-90** Longitude: -124.907 Work week: 45
 Platform: D.S. JORDAN Cast: **18** Secchi Depth: --- Day of Year: 312

** Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.*

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 300 | 305.1 | 12 | 7.255 | 34.064 | 26.646 | 89 | 34.265 | 0.059 | 2.011 | 53.726 | 1.638 |
| 400 | 405.3 | 11 | 6.070 | 34.064 | 26.804 | 89 | 37.402 | 0.039 | 2.347 | 68.166 | 1.275 |
| 500 | 505.3 | 10 | 5.297 | 34.131 | 26.952 | 89 | 40.974 | 0.051 | 2.718 | 85.430 | 0.750 |
| 600 | 606.9 | 9 | 4.881 | 34.222 | 27.072 | 89 | 39.999 | 0.151 | 2.937 | 95.270 | 0.380 |
| 700 | 705.8 | 8 | 4.583 | 34.309 | 27.174 | 89 | 42.842 | 0.060 | 2.947 | 107.46 | 0.242 |
| 800 | 807.1 | 7 | 4.265 | 34.355 | 27.245 | 89 | 44.106 | 0.056 | 3.068 | 116.18 | 0.235 |
| 900 | 907.8 | 6 | 4.015 | 34.411 | 27.316 | 89 | 44.581 | 0.017 | 3.165 | 123.03 | 0.311 |
| 1000 | 1008.5 | 5 | 3.791 | 34.449 | 27.369 | 89 | 44.340 | 0.082 | 3.076 | 127.31 | 0.422 |
| 1250 | 1261.7 | 4 | 3.248 | 34.518 | 27.477 | 89 | 44.150 | 0.131 | 3.180 | 139.73 | 0.786 |
| 1500 | 1514.6 | 3 | 2.782 | 34.557 | 27.551 | 89 | 43.540 | 0.010 | 2.914 | 150.16 | 1.073 |
| 1750 | 1768.9 | 2 | 2.396 | 34.582 | 27.604 | 89 | 42.969 | 0.034 | 2.930 | 162.83 | 1.315 |
| 2000 | 2019.2 | 1 | 2.104 | 34.610 | 27.651 | 89 | 43.434 | 0.060 | 2.984 | 169.00 | 1.653 |

Date: Nov 08, 2007 09:22 Cruise: **S407** Latitude: 35.452 Year: 2007
 Project: PACOOS Station: **67-90** Longitude: -124.898 Work week: 45
 Platform: D.S. JORDAN Cast: **19** Secchi Depth: 14 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.4 | 12 | 15.700 | 33.035 | 24.304 | 85 | 0.085 | 0.073 | 0.040 | 0.866 | 5.655 |
| 5 | 7.7 | 11 | 15.656 | 33.035 | 24.313 | 85 | 0.074 | 0.061 | 0.288 | 0.472 | 5.658 |
| 10 | 12.1 | 10 | 15.658 | 33.035 | 24.313 | 85 | 0.098 | 0.037 | 0.323 | 0.025 | 5.661 |
| 20 | 22.7 | 9 | 15.521 | 33.031 | 24.340 | 85 | 0.055 | 0.058 | 0.223 | 0.383 | 5.689 |
| 30 | 32.6 | 8 | 15.596 | 33.166 | 24.428 | 86 | 0.309 | 0.075 | 0.263 | 0.443 | 5.659 |
| 40 | 42.6 | 7 | 14.702 | 33.123 | 24.589 | 87 | 1.418 | 0.145 | 0.215 | 1.587 | 5.684 |
| 60 | 62.6 | 6 | 11.233 | 32.894 | 25.095 | 88 | 6.954 | 0.395 | 0.520 | 4.887 | 5.613 |
| 80 | 82.7 | 5 | 10.135 | 32.943 | 25.324 | 88 | 9.800 | 0.105 | 0.822 | 7.920 | 5.420 |
| 100 | 103.1 | 4 | 10.472 | 33.323 | 25.563 | 88 | 16.613 | 0.093 | 1.400 | 14.830 | 4.623 |
| 150 | 153.2 | 3 | 9.143 | 33.797 | 26.153 | 88 | 24.853 | 0.093 | 1.893 | 27.313 | 3.135 |
| 200 | 203.1 | 2 | 8.466 | 33.955 | 26.383 | 88 | 26.115 | 0.110 | 1.851 | 33.288 | 3.126 |
| 200 | 203.2 | 1 | 8.474 | 33.955 | 26.382 | 88 | 26.106 | 0.090 | 1.694 | 33.115 | 3.113 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.326 | 0.122 | 0 | 100 | 13.093 | 40.157 | 0 |
| 5 | 11 | 0.311 | 0.082 | 5 | 50 | 14.891 | 47.941 | 8 |
| 10 | 10 | 0.339 | 0.109 | 10 | 30 | 15.109 | 44.601 | 14 |
| 20 | 9 | 0.446 | 0.087 | 20 | 15 | 13.315 | 29.859 | 22 |
| 30 | 8 | 0.404 | 0.202 | 20 | 5 | 5.668 | 12.710 | 33 |
| 40 | 7 | 0.286 | 0.163 | 40 | 1 | 1.201 | 4.197 | 53 |
| 60 | 6 | 0.103 | 0.099 | 60 | 0.1 | 0.120 | 1.174 | 95 |
| 80 | 5 | 0.071 | 0.053 | | | | | |
| 100 | 4 | 0.050 | 0.033 | | | | | |
| 150 | 3 | 0.004 | 0.008 | | | | | |
| 200 | 2 | 0.003 | 0.003 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 20.06 | mg m-2 day -1 | Carbon Fixation: | 491.82 | mg m-2 day-1 |
| Phaeophytin: | 5.68 | mg m-2 day -1 | Productivity Index: | 24.52 | mg C mg Chl day-1 |
| Mixed Layer | 58 | meters | PBOpt: | 47.94 | mg C mg Chl day-1 |

Date: Nov 08, 2007 12:19 Cruise: **S407** Latitude: 35.750 Year: 2007
 Project: PACOOS Station: **62.25-90** Longitude: -125.123 Work week: 45
 Platform: D.S. JORDAN Cast: **20** Secchi Depth: 14 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.6 | 12 | 15.264 | 32.685 | 24.131 | 87 | 0.094 | 0.048 | 0.056 | 1.535 | 5.685 |
| 10 | 9.4 | 11 | 15.253 | 32.685 | 24.133 | 87 | 0.091 | 0.061 | 0.353 | 1.681 | 5.682 |
| 25 | 25.7 | 10 | 15.142 | 32.675 | 24.149 | 87 | 0.008 | 0.051 | 0.181 | 1.182 | 5.711 |
| 50 | 50.5 | 9 | 14.196 | 32.783 | 24.434 | 87 | 0.706 | 0.127 | 0.575 | 0.973 | 5.897 |
| 100 | 101.9 | 8 | 10.080 | 32.846 | 25.257 | 88 | 6.313 | 0.097 | 0.740 | 5.092 | 5.708 |
| 200 | 200.8 | 7 | 8.325 | 33.913 | 26.371 | 88 | 23.854 | 0.090 | 1.396 | 30.666 | 3.804 |
| 500 | 500.6 | 6 | 5.304 | 34.124 | 26.945 | 89 | 40.917 | 0.126 | 2.999 | 85.765 | 0.729 |
| 600 | 599.3 | 5 | 4.983 | 34.218 | 27.058 | 89 | 42.680 | 0.053 | 2.907 | 97.586 | 0.371 |
| 700 | 697.9 | 4 | 4.469 | 34.270 | 27.156 | 89 | 43.812 | 0.206 | 3.348 | 110.22 | 0.254 |
| 800 | 798.5 | 3 | 4.395 | 34.359 | 27.235 | 89 | 44.028 | 0.044 | 3.348 | 114.78 | 0.239 |
| 900 | 900.7 | 2 | 4.042 | 34.417 | 27.318 | 89 | 44.437 | 0.020 | 3.332 | 122.90 | 0.326 |
| 1000 | 1026.6 | 1 | 3.713 | 34.460 | 27.386 | 89 | 44.534 | 0.053 | 3.444 | 131.42 | 0.463 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.236 | 0.077 | 0 | 100 | 7.739 | 32.772 | 0 |
| 10 | 11 | 0.224 | 0.078 | 10 | 50 | 9.235 | 41.168 | 9 |
| 25 | 10 | 0.251 | 0.097 | 10 | 30 | 7.990 | 35.619 | 16 |
| 50 | 9 | 0.303 | 0.173 | 10 | 15 | 5.693 | 25.379 | 26 |
| 100 | 8 | 0.045 | 0.050 | 25 | 5 | 2.825 | 11.268 | 39 |
| 200 | 7 | 0.003 | 0.005 | 50 | 1 | 0.842 | 2.776 | 60 |
| 500 | 6 | 0.002 | 0.000 | 50 | 0.1 | 0.127 | 0.419 | 92 |
| 600 | 5 | 0.001 | 0.000 | | | | | |
| 700 | 4 | 0.001 | 0.000 | | | | | |
| 800 | 3 | 0.001 | 0.001 | | | | | |
| 900 | 2 | 0.000 | 0.002 | | | | | |
| 1000 | 1 | 0.001 | 0.003 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 14.71 | mg m-2 day -1 | Carbon Fixation: | 297.23 | mg m-2 day-1 |
| Phaeophytin: | 5.95 | mg m-2 day -1 | Productivity Index: | 20.20 | mg C mg Chl day-1 |
| Mixed Layer | 653 | meters | PBOpt: | 41.17 | mg C mg Chl day-1 |

Date: Nov 08, 2007 15:44 Cruise: **S407** Latitude: 36.038 Year: 2007
 Project: PACOOS Station: **63.5-90** Longitude: -125.339 Work week: 45
 Platform: D.S. JORDAN Cast: **21** Secchi Depth: 17 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.8 | 12 | 14.996 | 32.699 | 24.200 | 87 | 0.114 | 0.065 | 0.276 | 2.421 | 5.726 |
| 5 | 7.9 | 11 | 14.999 | 32.698 | 24.198 | 87 | 0.142 | 0.054 | 0.265 | 2.161 | 5.724 |
| 10 | 13.1 | 10 | 14.872 | 32.684 | 24.215 | 87 | 0.327 | 0.133 | 0.209 | 2.043 | 5.757 |
| 20 | 23.2 | 9 | 14.794 | 32.676 | 24.225 | 87 | 0.233 | 0.057 | 0.259 | 1.807 | 5.762 |
| 40 | 43.2 | 8 | 14.310 | 32.710 | 24.354 | 87 | 0.933 | 0.114 | 0.238 | 1.776 | 5.818 |
| 60 | 62.3 | 7 | 13.195 | 32.848 | 24.688 | 87 | 0.337 | 0.088 | 0.234 | 1.534 | 6.186 |
| 80 | 82.7 | 6 | 11.729 | 32.880 | 24.993 | 88 | 1.558 | 0.263 | 0.326 | 2.177 | 5.906 |
| 100 | 103.1 | 5 | 11.327 | 32.946 | 25.118 | 88 | 3.960 | 0.059 | 0.445 | 2.837 | 5.732 |
| 200 | 203.1 | 4 | 8.381 | 33.888 | 26.343 | 88 | 24.970 | 0.037 | 1.544 | 28.501 | 3.474 |
| 500 | 500.5 | 3 | 5.251 | 34.109 | 26.939 | 89 | 40.906 | 0.038 | 2.733 | 80.114 | 0.810 |
| 750 | 749.5 | 2 | 4.324 | 34.306 | 27.200 | 89 | 44.024 | 0.058 | 3.157 | 108.53 | 0.225 |
| 1000 | 1019.6 | 1 | 3.507 | 34.434 | 27.386 | 89 | 44.675 | 0.040 | 3.051 | 128.70 | 0.349 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.272 | 0.104 | 0 | 100 | 10.801 | 39.776 | 0 |
| 5 | 11 | 0.274 | 0.116 | 5 | 50 | 9.886 | 36.043 | 9 |
| 10 | 10 | 0.296 | 0.128 | 10 | 30 | 9.476 | 32.006 | 15 |
| 20 | 9 | 0.303 | 0.133 | 20 | 15 | 6.701 | 22.091 | 23 |
| 40 | 8 | 0.321 | 0.156 | 20 | 5 | 2.981 | 9.828 | 35 |
| 60 | 7 | 0.318 | 0.226 | 40 | 1 | 0.768 | 2.397 | 53 |
| 80 | 6 | 0.186 | 0.168 | 60 | 0.1 | 0.142 | 0.446 | 80 |
| 100 | 5 | 0.072 | 0.089 | | | | | |
| 200 | 4 | 0.005 | 0.019 | | | | | |
| 500 | 3 | 0.001 | 0.007 | | | | | |
| 750 | 2 | 0.001 | 0.004 | | | | | |
| 1000 | 1 | 0.002 | 0.013 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 15.96 | mg m-2 day -1 | Carbon Fixation: | 308.38 | mg m-2 day-1 |
| Phaeophytin: | 7.03 | mg m-2 day -1 | Productivity Index: | 19.32 | mg C mg Chl day-1 |
| Mixed Layer | 995 | meters | PBOpt: | 39.78 | mg C mg Chl day-1 |

Date: Nov 08, 2007 19:15 Cruise: **S407** Latitude: 36.325 Year: 2007
 Project: PACOOS Station: **61.75-90** Longitude: -125.554 Work week: 45
 Platform: D.S. JORDAN Cast: **22** Secchi Depth: 20 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.2 | 12 | 14.779 | 32.704 | 24.250 | 86 | 0.423 | 0.105 | 0.293 | 1.774 | 5.779 |
| 5 | 8.2 | 11 | 14.438 | 32.667 | 24.294 | 86 | 0.749 | 0.078 | 0.308 | 1.805 | 5.839 |
| 10 | 13.7 | 10 | 14.203 | 32.689 | 24.360 | 86 | 1.135 | 0.119 | 0.286 | 1.692 | 5.886 |
| 20 | 23.6 | 9 | 14.088 | 32.712 | 24.401 | 86 | 1.175 | 0.137 | 0.387 | 1.603 | 5.893 |
| 40 | 43.7 | 8 | 11.757 | 32.687 | 24.838 | 87 | 2.877 | 0.330 | 0.721 | 3.656 | 6.122 |
| 60 | 62.9 | 7 | 10.472 | 32.669 | 25.053 | 88 | 5.549 | 0.141 | 0.855 | 4.879 | 5.933 |
| 80 | 81.4 | 6 | 9.937 | 32.714 | 25.178 | 88 | 7.345 | 0.098 | 0.736 | 5.670 | 5.774 |
| 100 | 103.0 | 5 | 9.691 | 32.907 | 25.369 | 88 | 10.409 | 0.081 | 0.798 | 8.597 | 5.390 |
| 200 | 203.7 | 4 | 8.237 | 33.917 | 26.388 | 88 | 29.854 | 0.055 | 1.945 | 36.519 | 2.362 |
| 500 | 504.9 | 3 | 5.110 | 34.141 | 26.981 | 89 | 41.620 | 0.090 | 2.997 | 82.319 | 0.631 |
| 750 | 756.7 | 2 | 4.224 | 34.322 | 27.224 | 89 | 43.676 | 0.089 | 3.307 | 110.07 | 0.218 |
| 1000 | 1028.9 | 1 | 3.431 | 34.452 | 27.407 | 89 | 43.771 | 0.047 | 3.380 | 132.17 | 0.399 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.287 | 0.101 | 0 | 100 | 15.928 | 55.500 | 0 |
| 5 | 11 | 0.395 | 0.177 | 10 | 50 | 12.267 | 30.979 | 8 |
| 10 | 10 | 0.396 | 0.176 | 10 | 30 | 14.944 | 37.740 | 13 |
| 20 | 9 | 0.312 | 0.163 | 20 | 15 | 8.463 | 27.166 | 21 |
| 40 | 8 | 0.338 | 0.229 | 40 | 5 | 3.551 | 10.512 | 33 |
| 60 | 7 | 0.207 | 0.143 | 60 | 1 | 0.618 | 2.987 | 51 |
| 80 | 6 | 0.115 | 0.074 | 80 | 0.1 | 0.064 | 0.557 | 83 |
| 100 | 5 | 0.038 | 0.032 | | | | | |
| 200 | 4 | 0.004 | 0.021 | | | | | |
| 500 | 3 | 0.003 | 0.009 | | | | | |
| 750 | 2 | 0.002 | 0.007 | | | | | |
| 1000 | 1 | 0.002 | 0.007 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 16.30 | mg m-2 day -1 | Carbon Fixation: | 380.67 | mg m-2 day-1 |
| Phaeophytin: | 9.03 | mg m-2 day -1 | Productivity Index: | 23.36 | mg C mg Chl day-1 |
| Mixed Layer | 947 | meters | PBOpt: | 55.5 | mg C mg Chl day-1 |

Date: Nov 08, 2007 22:23 Cruise: **S407** Latitude: 36.614 Year: 2007
 Project: PACOOS Station: **60-90** Longitude: -125.771 Work week: 45
 Platform: D.S. JORDAN Cast: **23** Secchi Depth: 17 Day of Year: 312

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.5 | 12 | 13.961 | 32.717 | 24.431 | 85 | 1.554 | 0.197 | 0.499 | 2.605 | 5.943 |
| 5 | 8.4 | 11 | 13.964 | 32.716 | 24.430 | 85 | 1.501 | 0.163 | 0.640 | 2.385 | 5.943 |
| 10 | 13.6 | 10 | 13.876 | 32.717 | 24.449 | 85 | 1.453 | 0.144 | 0.537 | 2.080 | 5.945 |
| 20 | 23.8 | 9 | 13.665 | 32.748 | 24.516 | 85 | 2.168 | 0.201 | 0.425 | 2.138 | 5.939 |
| 30 | 33.4 | 8 | 13.840 | 32.848 | 24.558 | 86 | 2.550 | 0.187 | 0.271 | 2.227 | 5.859 |
| 40 | 43.4 | 7 | 12.095 | 32.738 | 24.815 | 87 | 3.951 | 0.351 | 0.449 | 3.704 | 5.908 |
| 60 | 63.4 | 6 | 9.741 | 33.067 | 25.486 | 88 | 15.678 | 0.093 | 1.159 | 13.893 | 4.987 |
| 80 | 83.4 | 5 | 9.394 | 33.435 | 25.830 | 88 | 21.061 | 0.184 | 1.700 | 20.888 | 4.260 |
| 100 | 103.9 | 4 | 9.015 | 33.628 | 26.041 | 88 | 24.296 | 0.115 | 1.707 | 25.443 | 3.745 |
| 150 | 153.5 | 3 | 8.171 | 33.903 | 26.387 | 88 | 27.493 | 0.115 | 1.841 | 32.572 | 3.144 |
| 200 | 204.6 | 2 | 7.603 | 33.963 | 26.518 | 88 | 29.423 | 0.195 | 1.960 | 39.108 | 2.723 |
| 2000 | 2020.7 | 1 | 1.961 | 34.614 | 27.665 | 89 | --- | --- | --- | --- | 1.675 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.425 | 0.145 | 0 | 100 | 25.965 | 61.089 | 0 |
| 5 | 11 | 0.427 | 0.141 | 5 | 50 | 28.857 | 67.602 | 7 |
| 10 | 10 | 0.461 | 0.176 | 10 | 30 | 23.771 | 51.523 | 12 |
| 20 | 9 | 0.488 | 0.193 | 20 | 15 | 15.674 | 32.138 | 19 |
| 30 | 8 | 0.440 | 0.193 | 30 | 5 | 6.231 | 14.176 | 30 |
| 40 | 7 | 0.350 | 0.206 | 40 | 1 | 1.327 | 3.794 | 48 |
| 60 | 6 | 0.069 | 0.070 | 60 | 0.1 | 0.088 | 1.280 | 93 |
| 80 | 5 | 0.030 | 0.049 | | | | | |
| 100 | 4 | 0.010 | 0.031 | | | | | |
| 150 | 3 | 0.004 | 0.023 | | | | | |
| 200 | 2 | 0.003 | 0.018 | | | | | |
| 2000 | 1 | 0.001 | 0.005 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 20.91 | mg m-2 day -1 | Carbon Fixation: | 657.38 | mg m-2 day-1 |
| Phaeophytin: | 8.88 | mg m-2 day -1 | Productivity Index: | 31.45 | mg C mg Chl day-1 |
| Mixed Layer | 983 | meters | PBOpt: | 67.6 | mg C mg Chl day-1 |

Date: Nov 09, 2007 02:34 Cruise: **S407** Latitude: 36.781 Year: 2007
 Project: PACOOS Station: **60-85** Longitude: -125.412 Work week: 45
 Platform: D.S. JORDAN Cast: **24** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.4 | 12 | 14.838 | 32.868 | 24.364 | 85 | 1.027 | 0.128 | 0.147 | 1.535 | 5.793 |
| 5 | 4.9 | 11 | 14.841 | 32.867 | 24.362 | 85 | 1.213 | 0.161 | 0.384 | 1.351 | 5.794 |
| 10 | 10.0 | 10 | 14.746 | 32.866 | 24.382 | 84 | 1.170 | 0.145 | 0.404 | 1.373 | 5.813 |
| 20 | 20.6 | 9 | 14.708 | 32.866 | 24.390 | 84 | 1.285 | 0.147 | 0.428 | 1.262 | 5.813 |
| 40 | 40.3 | 8 | 11.585 | 32.942 | 25.068 | 87 | 9.026 | 0.423 | 0.601 | 6.491 | 5.476 |
| 60 | 59.9 | 7 | 10.375 | 33.301 | 25.562 | 88 | 17.786 | 0.093 | 1.101 | 15.592 | 4.601 |
| 80 | 80.4 | 6 | 9.477 | 33.569 | 25.921 | 88 | 24.699 | 0.102 | 1.621 | 24.667 | 3.883 |
| 100 | 99.8 | 5 | 8.852 | 33.762 | 26.172 | 88 | 26.720 | 0.085 | 1.683 | 28.744 | 3.320 |
| 200 | 199.8 | 4 | 7.434 | 33.976 | 26.552 | 88 | 31.789 | 0.077 | 2.179 | 41.991 | 2.307 |
| 500 | 499.5 | 3 | 5.060 | 34.141 | 26.987 | 88 | 39.124 | 0.064 | 3.032 | 83.563 | 0.616 |
| 750 | 751.5 | 2 | 4.098 | 34.337 | 27.248 | 88 | 40.819 | 0.075 | --- | 111.77 | 0.222 |
| 1000 | 1022.8 | 1 | 3.463 | 34.470 | 27.418 | 88 | 44.719 | 0.078 | 3.286 | 132.02 | 0.485 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.375 | 0.140 | 0 | 100 | 21.539 | 57.422 | 0 |
| 5 | 11 | 0.388 | 0.123 | 5 | 50 | 27.748 | 71.552 | 8 |
| 10 | 10 | 0.460 | 0.146 | 10 | 30 | 24.809 | 53.984 | 13 |
| 20 | 9 | 0.511 | 0.181 | 20 | 15 | 18.983 | 37.125 | 20 |
| 40 | 8 | 0.361 | 0.236 | 20 | 5 | 7.732 | 15.121 | 31 |
| 60 | 7 | 0.226 | 0.167 | 40 | 1 | 1.300 | 3.605 | 47 |
| 80 | 6 | 0.064 | 0.060 | 60 | 0.1 | 0.095 | 0.420 | 77 |
| 100 | 5 | 0.012 | 0.039 | | | | | |
| 200 | 4 | 0.001 | 0.024 | | | | | |
| 500 | 3 | 0.001 | 0.010 | | | | | |
| 750 | 2 | 0.000 | 0.009 | | | | | |
| 1000 | 1 | 0.000 | 0.007 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 21.38 | mg m-2 day -1 | Carbon Fixation: | 696.46 | mg m-2 day-1 |
| Phaeophytin: | 8.32 | mg m-2 day -1 | Productivity Index: | 32.57 | mg C mg Chl day-1 |
| Mixed Layer | 15 | meters | PBOpt: | 71.55 | mg C mg Chl day-1 |

Date: Nov 09, 2007 06:21 Cruise: **S407** Latitude: 36.947 Year: 2007
 Project: PACOOS Station: **60-80** Longitude: -125.055 Work week: 45
 Platform: D.S. JORDAN Cast: **25** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.5 | 12 | 14.920 | 32.910 | 24.379 | 85 | 1.301 | 0.129 | 0.200 | 1.854 | 5.743 |
| 10 | 12.6 | 11 | 14.916 | 32.910 | 24.379 | 85 | 1.230 | 0.117 | 0.423 | 1.462 | 5.740 |
| 20 | 22.4 | 10 | 14.604 | 32.880 | 24.423 | 86 | 1.486 | 0.137 | 0.312 | 1.364 | 5.752 |
| 40 | 42.2 | 9 | 10.643 | 33.110 | 25.367 | 87 | 14.012 | 0.215 | 1.307 | 11.196 | 5.108 |
| 60 | 62.5 | 8 | 9.871 | 33.488 | 25.793 | 88 | 20.633 | 0.125 | 1.749 | 19.363 | 4.180 |
| 80 | 82.5 | 7 | 9.164 | 33.645 | 26.031 | 88 | 25.181 | 0.103 | 1.653 | 26.309 | 3.651 |
| 100 | 102.3 | 6 | 8.856 | 33.768 | 26.176 | 88 | 24.988 | 0.088 | 1.735 | 27.329 | 3.354 |
| 200 | 202.9 | 5 | 7.418 | 33.961 | 26.542 | 88 | --- | --- | --- | --- | 2.889 |
| 400 | 403.6 | 4 | 5.538 | 34.098 | 26.897 | 88 | 40.353 | 0.074 | 2.810 | 74.364 | 0.870 |
| 600 | 604.9 | 3 | 4.509 | 34.245 | 27.132 | 88 | 43.648 | 0.072 | 3.071 | 102.59 | 0.289 |
| 800 | 805.4 | 2 | 4.038 | 34.380 | 27.289 | 88 | 44.329 | 0.069 | 2.977 | 116.17 | 0.248 |
| 1000 | 1023.7 | 1 | 3.546 | 34.453 | 27.397 | 88 | 40.124 | 0.066 | 3.083 | 126.59 | 0.407 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.426 | 0.126 | 0 | 100 | 19.122 | 44.893 | 0 |
| 10 | 11 | 0.427 | 0.116 | 10 | 50 | 17.608 | 41.251 | 7 |
| 20 | 10 | 0.408 | 0.119 | 20 | 30 | 17.100 | 41.933 | 13 |
| 40 | 9 | 0.320 | 0.170 | 40 | 15 | 5.980 | 18.704 | 20 |
| 60 | 8 | 0.074 | 0.060 | 40 | 5 | 3.831 | 11.984 | 33 |
| 80 | 7 | 0.032 | 0.047 | 60 | 1 | 0.185 | 2.511 | 53 |
| 100 | 6 | 0.024 | 0.031 | 80 | 0.1 | 0.029 | 0.932 | 103 |
| 200 | 5 | 0.009 | 0.024 | | | | | |
| 400 | 4 | 0.004 | 0.012 | | | | | |
| 600 | 3 | 0.001 | 0.003 | | | | | |
| 800 | 2 | 0.000 | 0.002 | | | | | |
| 1000 | 1 | 0.001 | 0.001 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 16.03 | mg m-2 day -1 | Carbon Fixation: | 418.05 | mg m-2 day-1 |
| Phaeophytin: | 7.00 | mg m-2 day -1 | Productivity Index: | 26.08 | mg C mg Chl day-1 |
| Mixed Layer | 980 | meters | PBOpt: | 44.89 | mg C mg Chl day-1 |

Date: Nov 09, 2007 10:15 Cruise: **S407** Latitude: 37.114 Year: 2007
 Project: PACOOS Station: **60-75** Longitude: -124.693 Work week: 45
 Platform: D.S. JORDAN Cast: **26** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.6 | 12 | 13.271 | 32.754 | 24.600 | 84 | 2.106 | 0.149 | 0.468 | 3.205 | 6.061 |
| 10 | 12.5 | 11 | 12.922 | 32.818 | 24.718 | 85 | 3.234 | 0.168 | 0.420 | 3.586 | 6.069 |
| 20 | 22.2 | 10 | 12.285 | 32.822 | 24.844 | 85 | 5.837 | 0.260 | 0.137 | 5.713 | 6.029 |
| 40 | 42.9 | 9 | 9.799 | 32.813 | 25.278 | 88 | 10.880 | 0.078 | 0.820 | 8.917 | 5.482 |
| 60 | 62.6 | 8 | 9.438 | 33.281 | 25.702 | 88 | 17.338 | 0.087 | 1.091 | 16.220 | 4.686 |
| 80 | 82.7 | 7 | 8.997 | 33.598 | 26.021 | 89 | 21.068 | 0.080 | 1.277 | 21.074 | 3.992 |
| 100 | 102.7 | 6 | 9.045 | 33.856 | 26.216 | 89 | 27.001 | 0.074 | 1.909 | 28.864 | 2.637 |
| 200 | 201.5 | 5 | 7.968 | 34.071 | 26.549 | 89 | 33.002 | 0.055 | 2.205 | 42.999 | 1.540 |
| 400 | 402.1 | 4 | 5.903 | 34.109 | 26.861 | 89 | 38.958 | 0.066 | 2.686 | 70.405 | 0.928 |
| 600 | 604.9 | 3 | 5.211 | 34.310 | 27.104 | 89 | 41.977 | 0.103 | 3.171 | 91.471 | 0.273 |
| 800 | 805.4 | 2 | 4.403 | 34.399 | 27.266 | 89 | 43.669 | 0.079 | 3.093 | 108.86 | 0.298 |
| 1000 | 1014.5 | 1 | 3.796 | 34.468 | 27.384 | 89 | 43.570 | 0.061 | 3.279 | 120.70 | 0.507 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.863 | 0.316 | 0 | 100 | 49.030 | 56.826 | 0 |
| 10 | 11 | 0.845 | 0.275 | 10 | 50 | 46.047 | 54.517 | 5 |
| 20 | 10 | 0.836 | 0.326 | 20 | 30 | 32.175 | 38.508 | 9 |
| 40 | 9 | 0.262 | 0.136 | 40 | 15 | 4.677 | 17.820 | 15 |
| 60 | 8 | 0.047 | 0.098 | 40 | 5 | 3.061 | 11.664 | 24 |
| 80 | 7 | 0.013 | 0.046 | 60 | 1 | 0.099 | 2.097 | 39 |
| 100 | 6 | 0.012 | 0.215 | 80 | 0.1 | 0.000 | 0.000 | 77 |
| 200 | 5 | 0.001 | 0.052 | | | | | |
| 400 | 4 | 0.001 | 0.012 | | | | | |
| 600 | 3 | 0.001 | 0.011 | | | | | |
| 800 | 2 | 0.001 | 0.010 | | | | | |
| 1000 | 1 | 0.001 | 0.008 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 15.62 | mg m-2 day -1 | Carbon Fixation: | 570.84 | mg m-2 day-1 |
| Phaeophytin: | 7.02 | mg m-2 day -1 | Productivity Index: | 36.54 | mg C mg Chl day-1 |
| Mixed Layer | 907 | meters | PBOpt: | 56.83 | mg C mg Chl day-1 |

Date: Nov 09, 2007 13:58 Cruise: **S407** Latitude: 37.281 Year: 2007
 Project: PACOOS Station: **60-70** Longitude: -124.331 Work week: 45
 Platform: D.S. JORDAN Cast: **27** Secchi Depth: 17 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.0 | 12 | 13.561 | 33.181 | 24.872 | 87 | 4.772 | 0.242 | 0.211 | 4.368 | 5.900 |
| 10 | 10.0 | 11 | 13.564 | 33.181 | 24.871 | 87 | 4.819 | 0.258 | 0.284 | 4.058 | 5.903 |
| 20 | 19.8 | 10 | 13.362 | 33.217 | 24.939 | 87 | 5.759 | 0.305 | 0.466 | 4.661 | 5.897 |
| 40 | 40.3 | 9 | 11.447 | 33.441 | 25.481 | 88 | 16.347 | 0.139 | 1.072 | 14.049 | 4.456 |
| 60 | 60.1 | 8 | 10.743 | 33.602 | 25.733 | 88 | 21.393 | 0.062 | 1.264 | 20.039 | 3.682 |
| 80 | 79.8 | 7 | 10.124 | 33.754 | 25.958 | 88 | 25.095 | 0.036 | 1.595 | 26.444 | 2.870 |
| 100 | 99.5 | 6 | 9.785 | 33.826 | 26.071 | 88 | 26.462 | 0.035 | 1.692 | 28.426 | 2.588 |
| 200 | 200.2 | 5 | 8.126 | 34.050 | 26.509 | 89 | 31.330 | 0.050 | 2.119 | 39.457 | 1.866 |
| 400 | 399.2 | 4 | 6.281 | 34.151 | 26.846 | 89 | 38.340 | 0.048 | 2.665 | 67.272 | 0.819 |
| 600 | 602.1 | 3 | 5.102 | 34.278 | 27.091 | 89 | 42.117 | 0.060 | 3.038 | 92.800 | 0.293 |
| 800 | 799.1 | 2 | 4.414 | 34.376 | 27.246 | 89 | 42.921 | 0.098 | 3.296 | 105.74 | 0.255 |
| 1000 | 1027.2 | 1 | 3.688 | 34.453 | 27.383 | 89 | 44.055 | 0.074 | 3.435 | 123.02 | 0.422 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.387 | 0.108 | 0 | 100 | 21.330 | 55.130 | 0 |
| 10 | 11 | 0.381 | 0.138 | 10 | 50 | 19.837 | 52.129 | 8 |
| 20 | 10 | 0.549 | 0.186 | 10 | 30 | 13.898 | 36.521 | 13 |
| 40 | 9 | 0.261 | 0.181 | 20 | 15 | 15.460 | 28.182 | 20 |
| 60 | 8 | 0.131 | 0.143 | 20 | 5 | 7.370 | 13.436 | 31 |
| 80 | 7 | 0.039 | 0.144 | 40 | 1 | 0.818 | 3.138 | 50 |
| 100 | 6 | 0.022 | 0.118 | 60 | 0.1 | 0.108 | 0.829 | 84 |
| 200 | 5 | 0.003 | 0.043 | | | | | |
| 400 | 4 | 0.002 | 0.018 | | | | | |
| 600 | 3 | 0.001 | 0.011 | | | | | |
| 800 | 2 | 0.001 | 0.010 | | | | | |
| 1000 | 1 | 0.000 | 0.007 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 22.02 | mg m-2 day -1 | Carbon Fixation: | 557.23 | mg m-2 day-1 |
| Phaeophytin: | 8.34 | mg m-2 day -1 | Productivity Index: | 25.31 | mg C mg Chl day-1 |
| Mixed Layer | 21 | meters | PBOpt: | 55.13 | mg C mg Chl day-1 |

Date: Nov 09, 2007 17:51 Cruise: **S407** Latitude: 37.444 Year: 2007
 Project: PACOOS Station: **60-65** Longitude: -123.969 Work week: 45
 Platform: D.S. JORDAN Cast: **28** Secchi Depth: 21 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.1 | 12 | 13.831 | 33.189 | 24.822 | 86 | 4.012 | 0.193 | 0.182 | 3.607 | 5.883 |
| 10 | 13.5 | 11 | 13.522 | 33.249 | 24.932 | 87 | 5.449 | 0.233 | 0.320 | 4.615 | 5.908 |
| 20 | 23.5 | 10 | 12.372 | 33.287 | 25.188 | 87 | 12.841 | 0.553 | 0.987 | 10.250 | 5.046 |
| 40 | 42.8 | 9 | 10.390 | 33.467 | 25.689 | 88 | 20.225 | 0.109 | 1.661 | 18.746 | 4.050 |
| 60 | 63.6 | 8 | 10.024 | 33.744 | 25.967 | 88 | 24.907 | 0.072 | 2.038 | 25.234 | 2.986 |
| 80 | 83.7 | 7 | 9.705 | 33.839 | 26.095 | 88 | 26.475 | 0.059 | 2.144 | 27.922 | 2.555 |
| 100 | 103.2 | 6 | 9.375 | 33.893 | 26.191 | 88 | 27.367 | 0.069 | 2.075 | 29.620 | 2.265 |
| 200 | 203.4 | 5 | 8.480 | 34.093 | 26.489 | 88 | 31.977 | 0.074 | 2.449 | 40.246 | 1.459 |
| 400 | 403.5 | 4 | 6.244 | 34.157 | 26.855 | 89 | 38.550 | 0.106 | 2.999 | 68.546 | 0.789 |
| 600 | 605.6 | 3 | 5.096 | 34.269 | 27.085 | 89 | 42.301 | 0.050 | 3.318 | 90.234 | 0.288 |
| 800 | 806.5 | 2 | 4.460 | 34.376 | 27.241 | 89 | 43.517 | 0.076 | 3.309 | 105.29 | 0.266 |
| 1000 | 1025.6 | 1 | 3.781 | 34.460 | 27.379 | 89 | 43.869 | 0.094 | 3.326 | 122.38 | 0.450 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) | DEP (m) | % S. I. | CARBON (mg m-3 d-1) | PROD INDEX carbon/chl (mg m-3 d-1) | LIGHT DEPTH (m) |
|------------|----------|---------------------|-----------------------|------------|---------|------------------------|--|-----------------------|
| 0 | 12 | 0.518 | 0.118 | 0 | 100 | 13.717 | 26.497 | 0 |
| 10 | 11 | 0.512 | 0.163 | 10 | 50 | 13.603 | 26.557 | 7 |
| 20 | 10 | 0.417 | 0.271 | 10 | 30 | 13.675 | 26.698 | 12 |
| 40 | 9 | 0.224 | 0.166 | 20 | 15 | 6.425 | 15.413 | 19 |
| 60 | 8 | 0.040 | 0.091 | 40 | 5 | 1.479 | 6.594 | 30 |
| 80 | 7 | 0.020 | 0.086 | 60 | 1 | 0.195 | 4.891 | 50 |
| 100 | 6 | 0.012 | 0.081 | 80 | 0.1 | 0.375 | 18.759 | 95 |
| 200 | 5 | 0.004 | 0.059 | | | | | |
| 400 | 4 | 0.002 | 0.027 | | | | | |
| 600 | 3 | 0.002 | 0.013 | | | | | |
| 800 | 2 | 0.001 | 0.020 | | | | | |
| 1000 | 1 | 0.002 | 0.012 | | | | | |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-------|---------------|---------------------|--------|-------------------|
| Chlorophyll <i>a</i> : | 15.65 | mg m-2 day -1 | Carbon Fixation: | 293.22 | mg m-2 day-1 |
| Phaeophytin: | 8.38 | mg m-2 day -1 | Productivity Index: | 18.73 | mg C mg Chl day-1 |
| Mixed Layer | 202 | meters | PBOpt: | 26.7 | mg C mg Chl day-1 |

Date: Nov 09, 2007 21:40 Cruise: **S407** Latitude: 37.614 Year: 2007
 Project: PACOOS Station: **60-60** Longitude: -123.608 Work week: 45
 Platform: D.S. JORDAN Cast: **29** Secchi Depth: 14 Day of Year: 313

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.0 | 12 | 13.777 | 33.009 | 24.695 | 85 | 2.500 | 0.129 | 0.048 | 3.073 | 5.956 |
| 10 | 12.8 | 11 | 13.551 | 32.993 | 24.728 | 84 | 2.895 | 0.138 | 0.206 | 3.393 | 5.973 |
| 20 | 22.8 | 10 | 13.299 | 33.079 | 24.846 | 85 | 4.289 | 0.282 | 0.910 | 4.277 | 5.961 |
| 40 | 42.8 | 9 | 11.000 | 32.960 | 25.187 | 87 | 11.297 | 0.380 | 0.662 | 9.593 | 5.422 |
| 60 | 62.4 | 8 | 9.786 | 33.194 | 25.577 | 88 | 13.868 | 0.078 | 1.048 | 12.397 | 4.733 |
| 80 | 82.8 | 7 | 9.632 | 33.723 | 26.016 | 88 | --- | --- | --- | --- | 3.143 |
| 100 | 102.9 | 6 | 9.101 | 33.838 | 26.192 | 89 | 26.702 | 0.092 | 1.745 | 28.497 | 2.736 |
| 200 | 202.6 | 5 | 8.112 | 34.067 | 26.525 | 89 | 30.860 | 0.116 | 2.095 | 38.943 | 1.683 |
| 400 | 403.4 | 4 | 6.182 | 34.141 | 26.851 | 89 | --- | --- | --- | --- | 0.819 |
| 600 | 605.5 | 3 | 5.197 | 34.273 | 27.076 | 89 | 39.855 | 0.039 | 2.791 | 87.276 | 0.299 |
| 800 | 807.1 | 2 | 4.356 | 34.374 | 27.250 | 89 | 41.221 | 0.074 | 2.934 | 107.76 | 0.251 |
| 1000 | 1019.5 | 1 | 3.783 | 34.456 | 27.375 | 89 | --- | --- | --- | --- | 0.425 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) |
|------------|----------|---------------------|-----------------------|
| 0 | 12 | 0.643 | 0.139 |
| 10 | 11 | 0.745 | 0.205 |
| 20 | 10 | 0.681 | 0.226 |
| 40 | 9 | 0.526 | 0.289 |
| 60 | 8 | 0.119 | 0.084 |
| 80 | 7 | 0.023 | 0.082 |
| 100 | 6 | 0.006 | 0.053 |
| 200 | 5 | 0.002 | 0.029 |
| 400 | 4 | 0.002 | 0.022 |
| 600 | 3 | 0.002 | 0.015 |
| 800 | 2 | 0.002 | 0.013 |
| 1000 | 1 | 0.001 | 0.016 |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-----|---------------|---------------------|-----|-------------------|
| Chlorophyll <i>a</i> : | --- | mg m-2 day -1 | Carbon Fixation: | --- | mg m-2 day-1 |
| Phaeophytin: | --- | mg m-2 day -1 | Productivity Index: | --- | mg C mg Chl day-1 |
| Mixed Layer | 788 | meters | PBOpt: | --- | mg C mg Chl day-1 |

Date: Nov 10, 2007 00:15 Cruise: **S407** Latitude: 37.697 Year: 2007
 Project: PACOOS Station: **60-57.5** Longitude: -123.427 Work week: 45
 Platform: D.S. JORDAN Cast: **30** Secchi Depth: 16 Day of Year: 314

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 2.4 | 12 | 13.585 | 33.169 | 24.858 | 85 | 5.280 | 0.259 | 0.264 | 4.372 | 5.982 |
| 10 | 10.0 | 11 | 13.058 | 33.153 | 24.951 | 85 | 5.168 | 0.269 | 0.412 | 5.205 | 6.070 |
| 20 | 20.1 | 10 | 12.471 | 33.260 | 25.148 | 86 | 3.879 | 0.239 | 0.161 | 5.272 | 6.361 |
| 40 | 39.5 | 9 | 10.939 | 33.533 | 25.644 | 88 | 19.662 | 0.054 | 1.236 | 17.656 | 3.992 |
| 60 | 60.0 | 8 | 10.311 | 33.650 | 25.845 | 88 | 23.410 | 0.057 | 1.400 | 22.605 | 3.400 |
| 80 | 79.7 | 7 | 9.705 | 33.706 | 25.991 | 89 | 24.793 | 0.042 | 1.410 | 24.078 | 3.299 |
| 100 | 100.1 | 6 | 9.231 | 33.824 | 26.161 | 89 | 27.545 | 0.147 | 1.925 | 27.842 | 2.788 |
| 200 | 201.3 | 5 | 8.422 | 34.058 | 26.471 | 89 | 33.441 | 0.074 | 1.883 | 38.227 | 1.738 |
| 400 | 402.0 | 4 | 6.577 | 34.162 | 26.816 | 89 | 37.371 | 0.059 | 2.499 | 62.508 | 0.844 |
| 600 | 597.9 | 3 | 5.105 | 34.276 | 27.089 | 89 | 41.977 | 0.047 | 2.787 | 88.558 | 0.301 |
| 800 | 802.2 | 2 | 4.393 | 34.387 | 27.257 | 89 | 43.219 | 0.052 | 2.849 | 105.48 | 0.279 |
| 1000 | 1013.0 | 1 | 3.669 | 34.466 | 27.395 | 89 | 44.682 | 0.065 | 2.985 | 120.18 | 0.474 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) |
|------------|----------|---------------------|-----------------------|
| 0 | 12 | 0.836 | 0.173 |
| 10 | 11 | 0.826 | 0.267 |
| 20 | 10 | 1.117 | 0.494 |
| 40 | 9 | 0.177 | 0.159 |
| 60 | 8 | 0.099 | 0.132 |
| 80 | 7 | 0.074 | 0.132 |
| 100 | 6 | 0.023 | 0.099 |
| 200 | 5 | 0.009 | 0.067 |
| 400 | 4 | 0.006 | 0.050 |
| 600 | 3 | 0.003 | 0.040 |
| 800 | 2 | 0.004 | 0.025 |
| 1000 | 1 | 0.002 | 0.023 |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-----|---------------|---------------------|-----|-------------------|
| Chlorophyll <i>a</i> : | --- | mg m-2 day -1 | Carbon Fixation: | --- | mg m-2 day-1 |
| Phaeophytin: | --- | mg m-2 day -1 | Productivity Index: | --- | mg C mg Chl day-1 |
| Mixed Layer | 682 | meters | PBOpt: | --- | mg C mg Chl day-1 |

Date: Nov 10, 2007 03:02 Cruise: **S407** Latitude: 37.781 Year: 2007
 Project: PACOOS Station: **60-55** Longitude: -123.245 Work week: 45
 Platform: D.S. JORDAN Cast: **31** Secchi Depth: --- Day of Year: 314

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.5 | 12 | 12.835 | 33.317 | 25.122 | 79 | 1.003 | 0.206 | 0.071 | 9.325 | 7.794 |
| 5 | 4.9 | 11 | 12.752 | 33.316 | 25.137 | 78 | 0.956 | 0.048 | 0.094 | 7.984 | 7.317 |
| 10 | 10.0 | 10 | 12.432 | 33.334 | 25.214 | 85 | 4.696 | 0.044 | 0.412 | 7.733 | 6.035 |
| 20 | 20.3 | 9 | 11.537 | 33.463 | 25.481 | 87 | 14.365 | 0.031 | 0.881 | 14.925 | 4.550 |
| 30 | 29.9 | 8 | 10.871 | 33.599 | 25.708 | 87 | 20.533 | 0.048 | 1.448 | 21.571 | 3.682 |
| 40 | 40.4 | 7 | 10.614 | 33.651 | 25.793 | 88 | 23.452 | 0.063 | 1.489 | 22.186 | 3.358 |
| 60 | 59.7 | 6 | 10.001 | 33.797 | 26.012 | 86 | 26.099 | 0.039 | 1.732 | 30.246 | 2.412 |
| 80 | 80.4 | 5 | 9.648 | 33.876 | 26.133 | 85 | --- | --- | --- | --- | 1.890 |
| 100 | 100.7 | 4 | 9.622 | 33.881 | 26.141 | 85 | 28.513 | 0.055 | 2.003 | 36.323 | 1.846 |
| 100 | 100.5 | 3 | 9.621 | 33.881 | 26.142 | 85 | --- | --- | --- | --- | 1.848 |
| 115 | 116.1 | 2 | 9.592 | 33.886 | 26.150 | 85 | --- | --- | --- | --- | 1.891 |
| 115 | 116.5 | 1 | 9.572 | 33.889 | 26.156 | 85 | --- | --- | --- | --- | 1.901 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) |
|------------|----------|---------------------|-----------------------|
| 0 | 12 | 13.169 | 0.821 |
| 5 | 11 | 17.892 | 1.186 |
| 10 | 10 | 4.768 | 0.531 |
| 20 | 9 | 0.500 | 0.433 |
| 30 | 8 | 0.377 | 0.458 |
| 40 | 7 | 0.152 | 0.271 |
| 60 | 6 | 0.120 | 0.247 |
| 80 | 5 | 0.081 | 0.342 |
| 100 | 4 | 0.088 | 0.374 |
| 100 | 3 | 0.074 | 0.388 |
| 115 | 2 | 0.064 | 0.338 |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-----|---------------|---------------------|-----|-------------------|
| Chlorophyll <i>a</i> : | --- | mg m-2 day -1 | Carbon Fixation: | --- | mg m-2 day-1 |
| Phaeophytin: | --- | mg m-2 day -1 | Productivity Index: | --- | mg C mg Chl day-1 |
| Mixed Layer | 9 | meters | PBOpt: | --- | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|-------------------------|---------------|----------|--------------|------|
| Date | Nov 10, 2007 05:04 | Cruise: S407 | Latitude: | 37.861 | Year: | 2007 |
| Project: | PACOOS | Station: 60-52.5 | Longitude: | -123.074 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 32 | Secchi Depth: | --- | Day of Year: | 314 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.5 | 12 | 12.747 | 33.306 | 25.131 | 85 | 5.302 | 0.073 | 0.337 | 9.225 | 7.233 |
| 5 | 8.3 | 11 | 12.637 | 33.311 | 25.156 | 86 | 6.335 | 0.056 | 0.401 | 9.391 | 6.395 |
| 10 | 13.4 | 10 | 12.599 | 33.311 | 25.163 | 86 | 5.704 | 0.060 | 0.368 | 8.281 | 6.245 |
| 20 | 23.8 | 9 | 12.056 | 33.370 | 25.313 | 87 | 12.128 | 0.027 | 0.907 | 13.839 | 5.306 |
| 30 | 33.6 | 8 | 11.358 | 33.445 | 25.500 | 88 | 16.000 | 0.032 | 0.864 | 16.965 | 4.542 |
| 40 | 43.8 | 7 | 10.684 | 33.601 | 25.742 | 88 | 22.420 | 0.028 | 1.542 | 25.241 | 3.397 |
| 60 | 63.2 | 6 | 9.888 | 33.773 | 26.012 | 88 | 26.585 | 0.037 | 1.694 | 30.328 | 2.642 |
| 80 | 83.3 | 5 | 9.740 | 33.819 | 26.073 | 86 | 26.735 | 0.037 | 1.790 | 32.837 | 2.323 |
| 80 | 82.7 | 4 | 9.745 | 33.818 | 26.072 | 86 | --- | --- | --- | --- | 2.324 |
| 80 | 83.1 | 3 | 9.742 | 33.819 | 26.073 | 86 | --- | --- | --- | --- | 2.324 |
| 80 | 83.1 | 2 | 9.743 | 33.819 | 26.073 | 86 | --- | --- | --- | --- | 2.326 |
| 80 | 83.2 | 1 | 9.741 | 33.819 | 26.073 | 86 | --- | --- | --- | --- | 2.323 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) |
|------------|----------|---------------------|-----------------------|
| 0 | 12 | 2.116 | 0.258 |
| 5 | 11 | 2.125 | 0.317 |
| 10 | 10 | 2.043 | 0.763 |
| 20 | 9 | 0.781 | 0.491 |
| 30 | 8 | 0.490 | 0.451 |
| 40 | 7 | 0.222 | 0.329 |
| 60 | 6 | 0.106 | 0.286 |
| 80 | 5 | 0.103 | 0.407 |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-----|---------------|---------------------|-----|-------------------|
| Chlorophyll <i>a</i> : | --- | mg m-2 day -1 | Carbon Fixation: | --- | mg m-2 day-1 |
| Phaeophytin: | --- | mg m-2 day -1 | Productivity Index: | --- | mg C mg Chl day-1 |
| Mixed Layer | --- | meters | PBOpt: | --- | mg C mg Chl day-1 |

| | | | | | | |
|-----------|--------------------|-----------------------|---------------|----------|--------------|------|
| Date | Nov 10, 2007 07:06 | Cruise: S407 | Latitude: | 37.947 | Year: | 2007 |
| Project: | PACOOS | Station: 60-50 | Longitude: | -122.889 | Work week: | 45 |
| Platform: | D.S. JORDAN | Cast: 33 | Secchi Depth: | --- | Day of Year: | 314 |

* Note: Latitude and Longitude are reported in decimal degrees. '---' signifies no data.

Physical and Chemical

| DEP (m) | PRESS (db) | BTL # | TEMP (°C) | SAL (psu) | SIGMA T | TRANSMISS (%) | NO3 (μM) | NO2 (μM) | PO4 (μM) | SIO4 (μM) | O2 (ml l-1) |
|------------|---------------|----------|--------------|--------------|------------|------------------|-------------|-------------|-------------|--------------|----------------|
| 0 | 3.1 | 12 | 13.036 | 33.209 | 24.998 | 79 | 0.811 | 0.087 | 0.017 | 9.781 | 8.510 |
| 5 | 8.6 | 11 | 12.824 | 33.203 | 25.036 | 79 | 2.717 | 0.076 | 0.307 | 10.800 | 7.146 |
| 10 | 13.8 | 10 | 12.649 | 33.201 | 25.068 | 81 | 6.487 | 0.069 | 0.588 | 14.009 | 6.295 |
| 20 | 23.5 | 9 | 11.174 | 33.517 | 25.590 | 86 | 21.774 | 0.062 | 1.707 | 25.755 | 3.499 |
| 30 | 33.7 | 8 | 10.446 | 33.725 | 25.880 | 87 | 26.533 | 0.108 | 2.208 | 34.745 | 2.400 |
| 40 | 44.0 | 7 | 10.234 | 33.746 | 25.933 | 78 | 27.088 | 0.120 | 2.139 | 38.958 | 2.199 |
| 45 | 44.0 | 6 | 10.234 | 33.746 | 25.933 | 78 | --- | --- | --- | --- | 2.199 |
| 45 | 43.9 | 5 | 10.233 | 33.746 | 25.934 | 77 | --- | --- | --- | --- | 2.194 |
| 45 | 43.8 | 4 | 10.235 | 33.747 | 25.933 | 78 | --- | --- | --- | --- | 2.201 |
| 45 | 43.9 | 3 | 10.233 | 33.747 | 25.934 | 77 | --- | --- | --- | --- | 2.201 |
| 45 | 43.7 | 2 | 10.234 | 33.747 | 25.934 | 77 | --- | --- | --- | --- | 2.198 |
| 45 | 43.9 | 1 | 10.232 | 33.747 | 25.934 | 77 | --- | --- | --- | --- | 2.201 |

Biological

| DEP (m) | BTL # | CHL (mg m-3 d-1) | PHAEO (mg m-3 d-1) |
|------------|----------|---------------------|-----------------------|
| 0 | 12 | 8.083 | 0.735 |
| 5 | 11 | 8.810 | 0.856 |
| 10 | 10 | 7.538 | 1.110 |
| 20 | 9 | 1.371 | 0.647 |
| 30 | 8 | 0.318 | 0.615 |
| 40 | 7 | 0.381 | 0.924 |

Integrated Value

Integrated values are 1.0% of Surface Intensity (S.I.)

| | | | | | |
|------------------------|-----|---------------|---------------------|-----|-------------------|
| Chlorophyll <i>a</i> : | --- | mg m-2 day -1 | Carbon Fixation: | --- | mg m-2 day-1 |
| Phaeophytin: | --- | mg m-2 day -1 | Productivity Index: | --- | mg C mg Chl day-1 |
| Mixed Layer | --- | meters | PBOpt: | --- | mg C mg Chl day-1 |

Table A4: *Marine mammal observations.* This table lists the results of the marine mammal observations made during the PaCOOS cruise of November 2007. The data are listed alphabetically by species' scientific name, then chronologically within each species. Background shading alternates between gray and yellow by species. The darkness of the background shading within each colored background changes with date of sighting.

| Species Code | Scientific Name | Group Size | Date | Latitude (°N) | Longitude (°E) |
|--------------|-----------------------------------|------------|------------|---------------|----------------|
| 74 | <i>Balaenoptera physalus</i> | 4 | 11/06/2007 | 36.488 | -122.688 |
| 74 | <i>Balaenoptera physalus</i> | 2 | 11/07/2007 | 35.849 | -124.066 |
| 74 | <i>Balaenoptera physalus</i> | 5 | 11/07/2007 | 35.835 | -124.084 |
| 74 | <i>Balaenoptera physalus</i> | 3 | 11/07/2007 | 35.795 | -124.247 |
| 74 | <i>Balaenoptera physalus</i> | 2 | 11/07/2007 | 35.725 | -124.308 |
| 74 | <i>Balaenoptera physalus</i> | 2 | 11/07/2007 | 35.739 | -124.338 |
| 74 | <i>Balaenoptera physalus</i> | 2 | 11/08/2007 | 36.576 | -125.705 |
| 74 | <i>Balaenoptera physalus</i> | 1 | 11/08/2007 | 36.587 | -125.725 |
| 17 | <i>Delphinus delphis</i> | 75 | 11/06/2007 | 36.126 | -123.490 |
| 17 | <i>Delphinus delphis</i> | 860 | 11/07/2007 | 35.873 | -124.016 |
| 17 | <i>Delphinus delphis</i> | 230 | 11/07/2007 | 35.847 | -124.071 |
| 17 | <i>Delphinus delphis</i> | 650 | 11/07/2007 | 35.700 | -124.396 |
| 17 | <i>Delphinus delphis</i> | 250+ | 11/07/2007 | 35.626 | -124.554 |
| 17 | <i>Delphinus delphis</i> | 140 | 11/08/2007 | 35.933 | -125.259 |
| 17 | <i>Delphinus delphis</i> | 100+ | 11/08/2007 | 36.614 | -125.771 |
| 21 | <i>Grampus griseus</i> | 120 | 11/08/2007 | 36.053 | -125.365 |
| 22 | <i>Lagenorhynchus obliquidens</i> | 400 | 11/09/2007 | 37.719 | -123.496 |
| 22 | <i>Lagenorhynchus obliquidens</i> | 300 | 11/09/2007 | 37.682 | -123.421 |
| 27 | <i>Lissodelphis borealis</i> | 75 | 11/06/2007 | 36.686 | -122.277 |
| 27 | <i>Lissodelphis borealis</i> | 30 | 11/09/2007 | 37.556 | -123.769 |
| 27 | <i>Lissodelphis borealis</i> | 60 | 11/09/2007 | 37.719 | -123.418 |
| 27 | <i>Lissodelphis borealis</i> | 120 | 11/09/2007 | 37.686 | -123.428 |
| 27 | <i>Lissodelphis borealis</i> | 200 | 11/09/2007 | 37.682 | -123.420 |
| 76 | <i>Megaptera novaeangliae</i> | 1 | 11/06/2007 | 36.727 | -122.017 |
| 76 | <i>Megaptera novaeangliae</i> | 1 | 11/06/2007 | 36.718 | -122.081 |
| 76 | <i>Megaptera novaeangliae</i> | 2 | 11/06/2007 | 36.642 | -122.314 |
| 76 | <i>Megaptera novaeangliae</i> | 1 | 11/09/2007 | 37.576 | -123.765 |
| 76 | <i>Megaptera novaeangliae</i> | 2 | 11/09/2007 | 37.718 | -123.428 |
| 76 | <i>Megaptera novaeangliae</i> | 2 | 11/09/2007 | 37.668 | -123.397 |
| 40 | <i>Phocoena phocoena</i> | 2 | 11/09/2007 | 37.766 | -123.449 |
| 44 | <i>Phocoenoides dalli</i> | 6 | 11/06/2007 | 36.724 | -122.061 |
| 79 | unidentified whale | 1 | 11/07/2007 | 35.723 | -124.352 |
| - | PINNIPEDS | - | - | - | - |
| CU | <i>Callorhinus ursinus</i> | 1 | 11/07/2007 | 35.743 | -124.300 |
| MA | <i>Mirounga angustirostris</i> | 1 | 11/09/2007 | 37.534 | -123.774 |
| PU | unidentified pinniped | 1 | 11/09/2007 | 37.444 | -123.967 |

Table A5: *Summary of marine mammal observations.* This table summarizes the results of the marine mammal observations made during the PaCOOS cruise of November 2007. The data are listed alphabetically by species' scientific name.

| Species Code | Scientific Name | Total sightings | Total animals |
|--------------|-----------------------------------|------------------|---------------------|
| 74 | <i>Balaenoptera physalus</i> | 8 | 21 |
| 17 | <i>Delphinus delphis</i> | 7 | 1955 |
| 21 | <i>Grampus griseus</i> | 1 | 120 |
| 22 | <i>Lagenorhynchus obliquidens</i> | 2 | 700 |
| 27 | <i>Lissodelphis borealis</i> | 5 | 485 |
| 76 | <i>Megaptera novaeangliae</i> | 6 | 9 |
| 40 | <i>Phocoena phocoena</i> | 1 | 2 |
| 44 | <i>Phocoenoides dalli</i> | 1 | 6 |
| 79 | unidentified whale | 1 | 1 |
| - | PINNIPEDS | - | - |
| CU | <i>Callorhinus ursinus</i> | 1 | 1 |
| MA | <i>Mirounga angustirostris</i> | 1 | 1 |
| PU | unidentified pinniped | 1 | 1 |
| | | <u>35</u> | <u>3,302</u> |

Appendix B

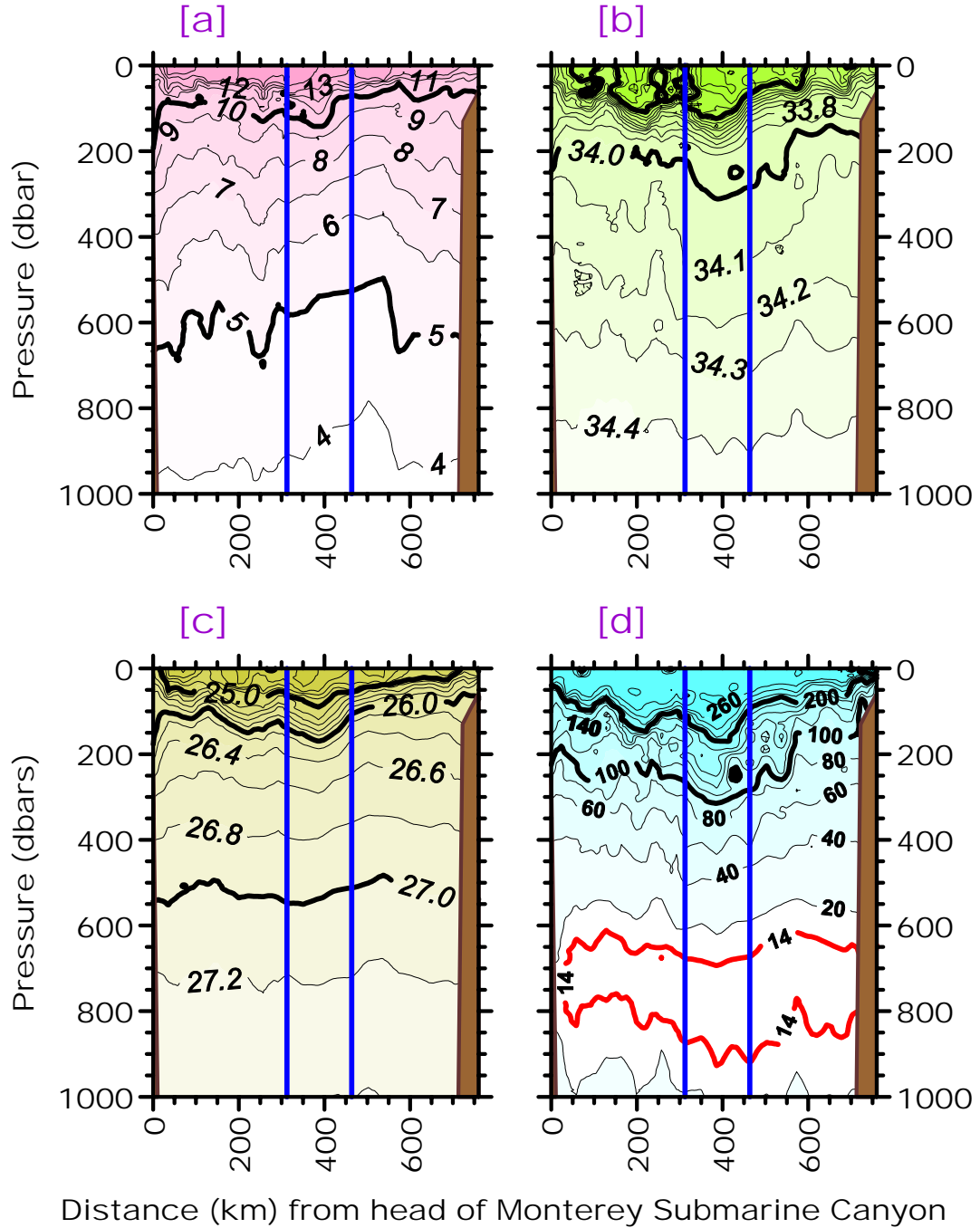


Figure 10: Contours of (a) temperature ($^{\circ}\text{C}$), (b) salinity, (c) density anomaly (kg m^{-3}), and (d) oxygen ($\mu\text{mol kg}^{-1}$) fields along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. The blue lines indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23). Contour intervals for panels a-d are 1°C , 0.1, 0.2 kg m^{-3} , and 20 $\mu\text{mol kg}^{-1}$, respectively, except that the (nearly) oxygen minimum contour of 14 $\mu\text{mol kg}^{-1}$ is highlighted in red in panel d.

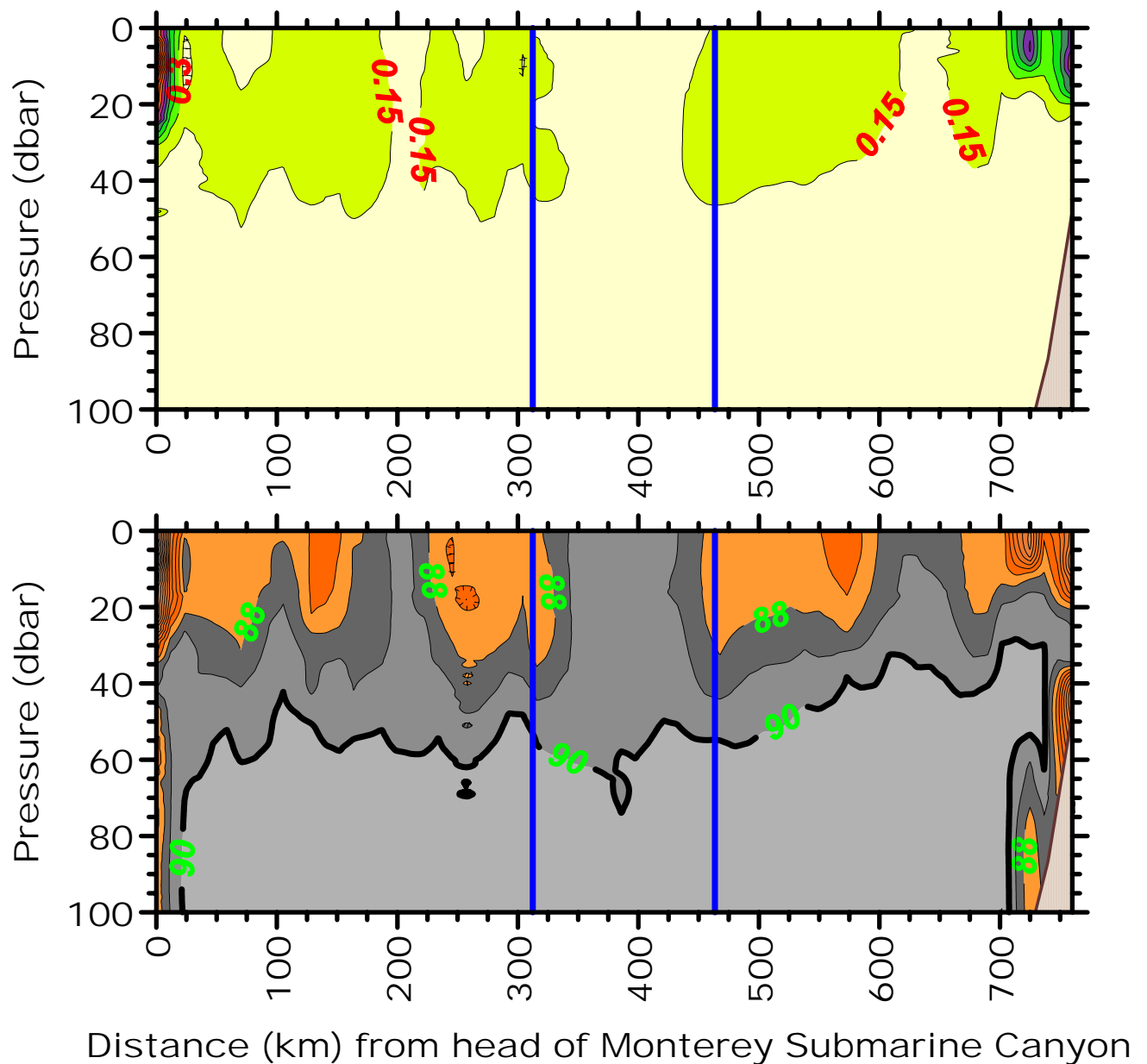


Figure 11: *Contours of fluorescence (volts) [upper panel] and transmissivity (percentage) [lower panel] in the upper 100 dbars of the water column along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. The blue lines indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23). The contour intervals are 0.15 volts and 1 percent, respectively, for the upper and lower panels. Closed contours are hatched if values are decreasing within the contour.*

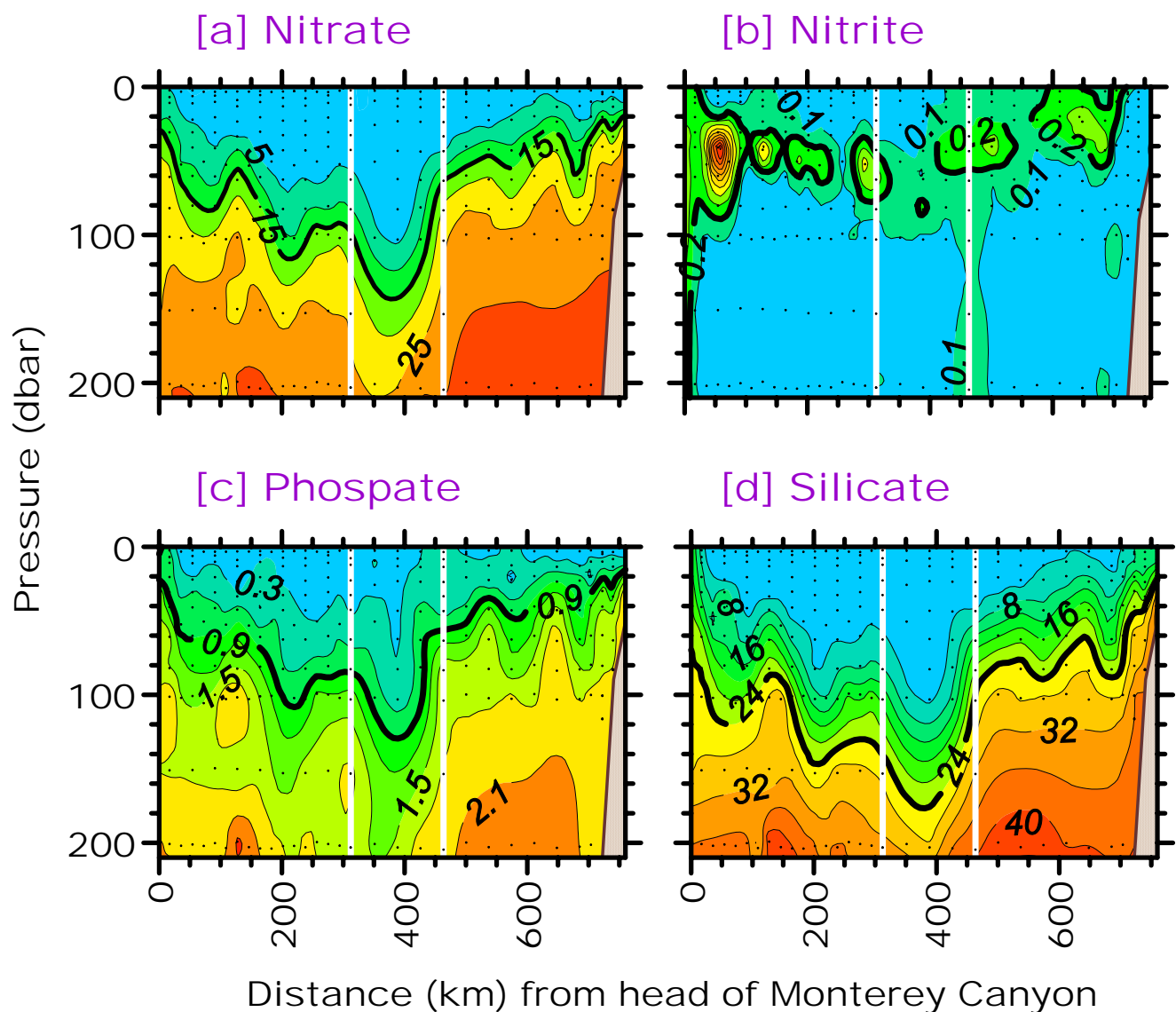


Figure 12: Contours of (a) nitrate (μM), (b) nitrite (μM), (c) phosphate (μM), and (d) silicate (μM) fields along the line of hydrographic stations from Moss Landing (on the left) to Drake's Bay, California. The white lines indicate the locations of the corner hydrographic stations (CTDs 18/19 and 23). The dots indicate the water sample locations. Contour intervals for panels a-d are $5\mu\text{M}$, $0.1\mu\text{M}$, $0.3\mu\text{M}$, and $4\mu\text{M}$, respectively.

INITIAL DISTRIBUTION LIST

- | | | |
|-----|--|---|
| 1. | Defense Technical Information Center 8725 John J. Kingman Rd., STE 0944 Ft. Belvoir, VA 22060-6218 | 2 |
| 2. | Dudley Knox Library, Code 013 Naval Postgraduate School Monterey, CA 93943-5100 | 2 |
| 3. | Reiko Michisaki Monterey Bay Aquarium Research Institute Moss Landing, CA | 1 |
| 4. | Baldo Marinovic Long Marine Laboratory University of California Santa Cruz, CA | 1 |
| 5. | Marguerite Blum Monterey Bay Aquarium Research Institute Moss Landing, CA | 1 |
| 6. | Katherine Whitaker Pacific Grove, CA | 1 |
| 7. | Steven Bograd NOAA Pacific Grove, CA | 1 |
| 8. | Arnold Mantyla University of California San Diego, CA | 1 |
| 9. | Teri Chereskin University of California San Diego, CA | 1 |
| 10. | Elizabeth Venrick University of California San Diego, CA | 1 |
| 11. | Bill Peterson NOAA Newport, OR | 1 |
| 12. | Ralf Goericke University of California San Diego, CA | 1 |

| | | |
|-----|--|---|
| 13. | Moss Landing Marine Laboratories Library Moss Landing, CA | 1 |
| 14. | Erika McPhee Shaw Moss Landing Marine Laboratories Moss Landing, CA | 1 |
| 15. | Frank Schwing NOAA Pacific Grove, CA | 1 |
| 16. | Reginaldo Durazo Universidad Autonoma de Baja California Ensenada, Mexico | 1 |
| 17. | Libe Washburn University of California Santa Barbara, CA | 1 |
| 18. | Paul Choboter CalPoly State University San Luis Obispo, CA | 1 |
| 19. | Roger Hewitt NOAA La Jolla, CA | 1 |
| 20. | Carmen G. Castro Consejo Superior de Investigaciones Científicas Spain | 1 |
| 21. | Newell Garfield San Francisco State University San Francisco, CA | 1 |
| 22. | Francisco Chavez Monterey Bay Aquarium Research Institute Moss Landing, CA | 1 |
| 23. | Tim Pennington Monterey Bay Aquarium Research Institute Moss Landing, CA | 1 |
| 24. | Mary Batteen Naval Postgraduate School Monterey, CA | 1 |
| 25. | Scott Hiller University of California La Jolla, CA | 1 |